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Practical Therapeutics

Edited by

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ORIGINAL COMMUNICATIONS.

INTRAVENOUS INJECTION OF QUININE DIHYDROCHLORIDE AND CACODYLATE OF SODA IN TREATMENT OF CHRONIC MALARIA.

BY JOHN C. CLARK, M.D., MEMPHIS, TENN.

It is not my intention to claim any priority in the use of either quinine or arsenic intravenously, in the treatment of malaria. Rather it is my purpose to describe the technique and dosage which I have employed in this form of medication, and to record my experience both as to the results obtained and the reactions which manifested themselves following their use.

This report includes fifty-seven cases of chronic malaria, seen in private practice during the year 1917, in which four hundred and sixty-seven intravenous injections of quinine dihydrochloride in combination with sodium cacodylate were given.

That I may be understood in the use of the term chronic malaria, I have adopted the classification of Deaderick and Thompson as employed by them in their publication "Endemic Diseases of the Southern States:"

"There is a great deal of confusion as to what is comprehended by chronic malaria. Much of this chaos is due to including the manifestations of malarial cachexia with those of chronic malaria, between which, however, there are essential differences. Chronic malaria implies a supply of vital resistance equal to the demand; malarial cachexia denotes an exhaustion of this supply. Chronic malaria is an antagonistic equilibrium between parasite and host; cachexia, a rupture of equilibrium. Chronic malaria is a conflict, cachexia a conquest. The relation between chronic malaria and cachexia has been fitly compared to that existing between a compensated heart lesion and broken compensation. Chronic malaria is an active form of malaria; cachexia, a sequel. Cachexia being a sequel, usually of chronic malaria, it may be difficult to say where the influence of the latter ends and the former begins. On the other hand, it is frequently difficult or impossible to differentiate between a relapse in chronic malaria and a reinfection."

There was no effort made to select these cases, but all malarial patients conforming to the above classification, regardless of their age or physical condition, which did not in the hands of the writer nor in the hands of other physicians respond to other methods, were advised to take this form of treatment, and among those so advised will be found the fifty-seven cases reported.

I am unable to classify the cases covered by this report with reference to the various types of infection, as in about 25 per cent even after repeated efforts by the thick smear method of Ross, or the concentrated method as described by Krauss and Fleming, I was unable to demonstrate the presence of the organism, and in approximately an additional 25 per cent I was unable to make a satisfactory classification. In those cases in which the plasmodia were not found the diagnosis was based on the history, the physical findings, the presence in the urine of urobilin, together with the general blood picture. The treatment of this series is based on the assumption that a sufficient concentration of quinine in the blood is toxic to the asexual plasmodia in any stage of its development, and to the immature

sexual type; that the life of the gamete does not exceed six weeks, and that relapses in those who have had sufficient quinine to free the blood of the asexual organisms are due to the power of parthenogenesis as possessed by the macrogamete, from which process not only the asexual but after repeated paroxysms the sexual organisms are developed, and on the further assumption that the parthenogenetic cycle is not completed during that period in which a sufficient blood-quinine concentration, toxic to the asexual type, is maintained.

I shall not attempt to explain the method by which quinine exercises its toxic effect, and I realize that there are a great many who will take issue with what I have said; however, I have repeatedly examined fresh blood specimens in which the ameboid movement of the organism was clearly observed previous to the intravenous injection of quinine and arsenic, as was carried out in this series, when subsequent fresh blood specimens would fail to show any mobility on the part of the organism. If the absence of the ameboid movement is to be interpreted as denoting the toxic effect of quinine, the indications are twofold: first, a sufficient blood-quinine concentration should be maintained for that period necessary to rid the blood of the asexual type of the organism; and second, to so interrupt the parthenogenetic cycle by a sufficient blood-quinine concentration, constant or interrupted, as to prevent the development of either type of the organism, and to maintain this interruption for a period of time greater than the possible life of those macrogametes which were in the blood at the time treatment was begun. The use of sodium cacodylate was based on the well-recognized value of arsenic in the treatment of malaria.

In this work I use quinine dihydrochloride, as the chlorides harmonize with the natural secretions of the organism more closely than do other salts, and when introduced directly into the blood the dihydrochloride is less of a foreign matter. In the selection of a suitable preparation of this salt for intravenous use the glaseptic ampoules marketed by P., D. & Co. were used. These ampoules contain a sterile solution, so prepared that each Cc. represents one-half grain of this salt. Experience has shown this to be a perfectly safe dilution for intravenous use. The syringe can be easily filled, direct, hence the necessity for resterilization is avoided. For general use these ampoules offer a decided advantage, and with those who are not so situated as to be able to secure fresh distilled water, from which all intravenous solutions should be prepared, some form of a sterile solution, properly diluted and hermetically sealed, is almost a necessity.

In the administration of quinine dihydrochloride, in combination with cacodylate of soda, I have adopted the following dosage: One grain of quinine for each ten pounds of body weight, and one grain of cacodylate of soda for each fifty pounds of body weight; these amounts to be given daily for five days. Subsequently, on each succeeding fifth day, for a period of thirty-five days, I gave quinine in the same amount mentioned above, with one grain of cacodylate of soda for each twenty-five pounds of body weight. As an additional treatment, each patient was given daily a certain amount of quinine hydrochloride by mouth, an average of five grains, together with Blaud's mass, laxatives, etc., depending on the general condition of the patient, and when necessary alkali diuretics in sufficient quantity to insure a relatively low urine acidity.

The technique which I have employed is as follows:

All intravenous injections are given with the patient in a horizontal position, without elevating the head. The ordinary 20-Cc. all-glass Record syringe is used, carrying a very small needle, 22 to 24 gauge, 12 to 14 mm. in length.

The veins of the arm, at the elbow, are given preference, and the same aseptic measures employed as in any operative procedure. In obstructing the venous circulation I use the sphygmomanometer, my

assistant employing a sufficient pressure to properly engorge the veins, care being exercised not to interfere with the arterial circulation. I then direct the patient to slowly open and close the hand, which insures a sufficient venous tension. In most cases the veins are readily seen; however, in a certain percentage they are not superficial, and their course can only be determined by palpation. In the former cases it is comparatively an easy matter to introduce the needle into the vein, but in those whose veins are not superficial a certain amount of skill is required.

In the introduction of the needle I avoid entering the vein at the time of making the skin puncture; my practice is to introduce the needle beneath the skin; then to employ careful palpation in order to determine the location of the needle with reference to the vein. The needle is partially withdrawn, so as to expose about two-thirds of its length; the body of the syringe is then carried to that position which will direct the point of the needle toward the vein at an angle of about 45 degrees. In this position the vein is entered; care being exercised not to penetrate the opposite wall. A lack of resistance to the needle and a flow of venous blood into the syringe assures one that the vein has been entered; immediately my assistant releases the pressure which has been maintained by the sphygmomanometer, and while this is being done I carry the body of the syringe to such a position that I may introduce the needle its full length within the vein without injuring its walls. The injection is now begun and the solution is forced into the vein by an even, constant pressure on the piston of the syringe, at the rate of about one Cc. per minute.

During the process of injection the condition of the patient is closely watched. Previous to the introduction of the needle, it is well to so arrange the patient that the arm of the operator may have support during the injection; this will prevent cramping of the muscles and will enable the operator to so control the needle as to avoid injuring the endothelial coat of the vein. Should the patient during the injection complain of a burning or painful sensation at the point of puncture, it is evident that a portion of the solution has escaped into the cellular tissue; this may be the result of leakage around the needle, or a slight movement on the part of the operator or of the patient may dislodge the point of the needle from within the vein. In either instance the injection should be discontinued, and if due to the former, pressure over the venous puncture will usually suffice; if due to the latter, the venous flow is again obstructed and the needle is so manipulated as to assure the operator that he is again within the vein; the injection is then continued. The escape of this solution causes an almost immediate edema of the cellular tissue, and it will occasionally be necessary to withdraw the needle entirely and to select a different point of puncture. Having completed the injection, pressure is made at the point of venous puncture, as the needle is being withdrawn; this pressure is maintained for three or four minutes, so as to prevent hemorrhage. The skin puncture is then sealed with collodion.

The after-care of these patients consists of the oral administration of from one to two drachms of alcohol containing five minims of chloroform to the drachm, after which they remain in a reclining posture for a variable length of time before being allowed to leave the office, with final instructions to avoid undue exercise for a few hours. The reactions which are occasionally manifested, and which were frequently observed in the intravenous work which I did in 1916, are now largely prevented.

I have called attention to the use of *fresh* distilled water as being almost a necessity in the preparation of any intravenous solution, and there is some authority for the belief that failure to use *fresh* distilled water is in a large measure responsible for the chill which Jackson mentions as occurring in about one-third of these injections. This belief prompted me to use

the hermetically sealed glaseptic ampoules, previously referred to, since which this reaction has been minimized.

I have never, personally, seen an infection, and there have been no fatalities. In fact, I have never seen in this series a reaction which did not right itself within the time expected.

The results of this treatment have been very gratifying. Of the fifty-seven cases reported, thirty-two were under treatment for forty days or more, and it is this group of thirty-two cases which is the basis from which results are reckoned. The remaining twenty-five cases were among out-of-town patients who were given from one to five injections, for relief only.

I have been able to follow twenty-seven of these thirty-two cases, and to date in only two instances has there been any evidence of a relapse; and it is possible that these two were cases of reinfection.

In the majority the improvement was so marked that it was noticeable from day to day. In those in which the malaria was only in part responsible for the condition the improvement was less marked. There was an average increase of red blood cells of 1,125,000, with a hemoglobin increase of about 40 per cent. At the time treatment was discontinued we were unable to demonstrate the malarial organism in any form, or to detect any other evidence of malaria.

PRACTICAL DRUG CONSERVATION.[1]

BY AMBROSE HUNSBERGER, PH.G.,
President of the Philadelphia Branch American Pharmaceutical Association, 1917-18.

The question of conserving drug-store supplies during a national war crisis such as the one through which we are passing at the present time would seem to demand the most careful consideration and unflagging persistence of the practicing pharmacist in its solution. It is peculiarly a problem for the pharmacist, inasmuch as he ought to be in the best position to recognize the limitations which will maintain drug conservation within the bounds of common sense without sacrificing efficiency, and he should further be able, by virtue of his practical experience, to determine the line of least resistance to be followed in order that the most helpful results may be achieved in the shortest possible time.

When we stop to consider the close relationship of the pharmacist with the public, we are readily able to recognize his obligation in that direction, and it becomes apparent that whatever he can do in the way of curtailing excess and waste in the practice of his calling should be done without the slightest delay. Of course, the thought suggests itself concerning a reciprocal obligation on the part of the public. If it is not a recognized principle now it will be, probably soon, that many things which are considered indispensable necessities under normal conditions of living become distinctly non-essential, if not positive luxuries, during periods of stress and strife. This principle is quite as applicable to the production of drug supplies as to that of any other commodity consumed by the public, and so applied means relegating to the back top shelf for the period of the war many of the "elegant pharmaceuticals" and nostrums, some of which are said to make therapeutic efficiency a secondary consideration at best. What if the tonic elixir does appeal a little less to the eye, nose, and palate, or the cough syrup is only half as cloyey, or the stomachic loses a part of its alcoholic tang, and the favorite digestant temporarily foregoes its emulation of the far-famed cordial of the Benedictine monks. The esthetic must sacrifice itself on the altar of practicability, and it is reasonable to presume that our loyal public will accept its obligation in the matter of

[1]Read before the Philadelphia Branch of the American Pharmaceutical Association, Feb. 5, 1918.

conserving drug supplies which are difficult to secure, when it is made clear that the heaviest demand upon the restricted substances is created by the effort to appeal to its finicky palate.

As regards the problem before us, it may be said that practical conservation in the drug store includes restriction in the use of many substances which under normal conditions are used in enormous quantities without any special thought being given to the availability of future supplies. A brief list (excluding substances employed in the manufacture of galenicals) includes bottles, jars, tins, glass and paper boxes, paper and metal caps, extra wrappers, outer cartons, special seals, etc., some of the latter being designed to provide greater security of contents, but perhaps most of them being calculated to lend an air of distinctiveness to the package, a commendable procedure normally, but one that should be eliminated in war-time. Conservation of containers may be practiced by reducing the variety of sizes in bottled or boxed substances, since in most instances the public will adjust itself to a small emergency package intended for immediate use and a larger so-called family size for continuous use. This would do away with the myriad of intermediate-sized packages of household drugs and chemicals, toilet articles, etc., and would release a large volume of paper, glass, and tin containers, allowing the material and labor used in their construction to be used for more urgent purposes. Where is the need of offering cold cream in four sizes, or talcum powder in two sizes of four odors each, or skin lotions and creams in 25-cent, 50-cent, and $1.00 sizes? Why not, as regards the latter, eliminate the medium size; or still better as a war measure, retain the medium size and release the other two? In other words, instead of applying the old maxim about making "two blades of grass grow where one grew before," reverse its principle and paraphrase it to have "one bottle blown where two were blown before," and apply the principle to each detail of pharmaceutical practice. To be sure, this may not seem to accomplish a great deal in the way of conserving the resources of our country when viewed from the individual standpoint, but if we stop to consider that fifty thousand pharmacists throughout the country can put the plan into operation within a very brief period, the potentialities of the suggestion become more apparent.

While the shortage of materials used in the manufacture of containers and other drug-store accessories is serious in itself, it is second in importance to a consideration of ways and means of curtailing the use of substances which directly affect our supply of food, munitions, and essential medicinal substances. Chief among these may be mentioned alcohol, glycerin, sugar, and certain vegetable drugs and chemicals.

The control of these supplies is perhaps best discussed by a classification of methods, as follows:

Conservation by elimination.

Conservation by substitution.

Conservation by coöperation of medical profession.

In the first classification is included the suggestion above outlined as regards containers, etc., and also certain remarks to follow under the last classification.

Conservation by substitution presents several angles, viz., the substitution of sweetening agents such as honey, glucose, etc., for syrup, the use of saccharin for the same purpose, and the substitution of glycerin for alcohol, syrup for glycerin, aromatic waters for syrup, etc. The first angle does not appear to accomplish much more than to shift the burden from the right hand to the left, inasmuch as either or all of the substances suggested as sugar substitutes are equally as adaptable to domestic use and should therefore be left available for that purpose. In the second angle it may be said that the judicious substitution of saccharin as a sweetening agent for medicinal substances is perhaps permissible in some instances because this substance is not fitted for indiscriminate use in food products. The third angle of the proposition is discussed later.

Conservation by coöperation of the med-

ical profession appears to offer the solution that promises to achieve the quickest and most beneficial results. Since the art of pharmacy exists primarily for the purpose of supplying the needs of the sick as seen through the eyes of the medical profession, does it not seem feasible and proper to ask coöperation of that body in the campaign for conservation of drug supplies, and can there be a lurking doubt that the coöperation asked for would not be granted, enthusiastically and freely. It is probably safe to assume that the medical profession would welcome any suggestion which might point a way for them to still further advance the interests and safeguard the physical welfare of the citizens of our country.

The best reason for this assumption of coöperation rests upon the fact that the medical profession of our country has outstripped any other single body of citizens in its devotion to the country's cause in the present war. Medical practices developed by years of application, lucrative incomes which they yielded, near realization of ambitions for professional advancement, fond domestic and social ties, assurance of comfortable futures—all were relinquished promptly and unselfishly by thousands of our medical practitioners when the call came, and they placed their abilities and energies unreservedly at the disposal of our government. To make such acknowledgment of the splendidly patriotic attitude of our medical men, in and out of the service, is directly related to our discussion, and were it pure digression it would still be entirely pardonable, because one would have to be churlish, indeed, to have enjoyed the cordial friendship of many of these manly men and fail to fully and freely commend the fine quality of their citizenship.

Assuming, then, the patriotic coöperation and receptive attitude of the medical practitioners of the United States in the matter of conservation, it becomes incumbent upon the pharmacist to furnish the information that comes to him in his daily practice regarding fluctuations in supplies and prices of drugs, to direct attention to declining stocks of certain ones and the possibly increasing supplies of others previously curtailed, to discuss tested substitute products for those unavailable as well as for those which by virtue of controlled supplies achieve extortionate if not prohibitive prices, to advocate reductions in the size of prescriptions calling for scarce drug and chemical products, and to encourage curtailment and, whenever possible, entire elimination from prescriptions of such substances as syrup, glycerin, and alcohol, singly or in combination, when they serve no more laudable purpose than an appeal to a frivolous or jaded palate.

Personal experiences furnish concrete examples of the practical results which may be obtained through intelligent and (in these times) patriotic coöperation between physician and pharmacist. For years a well-known oculist ordered one grain of his favorite mydriatic in a fluidrachm of distilled water. When informed that supplies of the substance were running low and the cost mounting high, he changed his formula to one-third grain mydriatic in twenty minims of distilled water, with entire satisfaction to himself and his patients, and proud of his achievement in conserving two-thirds of his normal consumption of a rare chemical. Another practitioner was in the habit of prescribing from four to six ounces of compound tincture of benzoin, with the directions to the patient to "add two teaspoonfuls to a pint of boiling water and inhale the steam." When informed of the difficulty involved in procuring certain ingredients contained in compound tincture of benzoin, he reduced his order to *one* ounce of tincture with directions to add *fifteen* drops to *one* cup of boiling water.

Another changed his favorite combination of ammonium chloride and syrup lactucarium to one containing an equal dose of the active ingredient in a vehicle consisting of one part syrup and three parts anise water, with no noticeable sacrifice of therapeutic efficiency, according to his statement. Still another has been securing results with a capsule of terpin hydrate and heroin that are quite comparable with those he formerly observed when using the elixir containing

the same substances. He is justly proud of the fact that he is a practical conservationist, and the available supply of alcohol, glycerin, and sugar is automatically maintained.

A final reference to the ready compliance of still another practitioner with the suggestion that an ointment used in rather generous quantity might serve equally well as a protective coating if petrolatum were employed as a vehicle in place of benzoinated lard, points the way to conservation of animal fats.

It is said to be difficult indeed to attempt to measure the relative difference in therapeutic value between a dose of terpin hydrate and heroin administered in pill, powder, or capsule form, and a dose of the same substance administered in the vehicle provided in the formula for elixir terpin hydrate and heroin, and it would seem to require equal temerity to attempt to demonstrate that ammonium chloride was any less effective as an expectorant given in cinnamon water than it is when dissolved in syrup lactucarium, or that pepsin extemporaneously dissolved in compound infusion gentian lacked any of the digestant qualities ostensibly possessed by the same substance when exhibited in more delectable vehicles. Indeed, the deeper one delves into the question of drug conservation in the drug store, the more one is inclined to the thought that, while upon the surface the necessity for conserving certain supplies may require more or less readjustment, as a matter of fact rational therapeutics, properly supported by rational pharmaceutical practice, to a great extent solves the problem, and if the rational practice of these two arts shall become a fixed habit the national emergency that actuated the readjustment will have been, indeed, a blessing in disguise to the practice of pharmacy.

While it is perhaps true that all medical practitioners will not receive this method of applied drug conservation with enthusiasm, or even with cordiality, it is probably a fact nevertheless that an inestimably greater number will be governed by the need of the hour and welcome this additional opportunity to promote the interests of our country by assisting in the conservation of its resources as far as lies in their power. Space does not permit a systematic arrangement of the most prescribed substances, but a suggestion as to the possibilities involved is obtained by a brief reference to but a few classes of substances, with conservation forms of administration:

Ammonium salts, in aromatic water with 10 to 25 per cent syrup (or none).

Potassium salts, in aromatic water with 10 to 25 per cent syrup (or none).

Sodium salts, in aromatic water with 10 to 25 per cent syrup (or none).

Calcium salts, in aromatic water with 10 to 25 per cent syrup (or none).

Strontium salts, in aromatic water with 10 to 25 per cent syrup (or none).

Mercury salts, in pill or capsule form.

Strychnine salts, in pill or capsule form.

Opium and alkaloids, in pill or capsule form.

Cinchona and alkaloids, in capsule, pill, or wafer.

Digestive agents, in powder or capsule.

Vegetable drugs, in capsule, powder, pill, or infusion.

Antipyretics (coal tar), in capsule, powder, or wafer.

This brief scheme is of course susceptible of unlimited extension and numberless variations, and from that standpoint may be criticized as being cumbersome and complex. The fact is, however, that the individual medical practitioner is interested only in the remedial agents which he is in the habit of prescribing, and the facility with which he will master a system which will eliminate the restricted substances from his prescriptions will be governed by his interest in the matter. It is not to be gainsaid that here and there substances exist which, by virtue of their physical characteristics, render imperative the use of alcohol or glycerin in their preparation for use, or the addition of sugar to facilitate administration; but their number is negligible and the quantity of the above-mentioned substances can probably be spared to that extent for pharmaceutical purposes. Under any plan of conservation a portion of these substances will have to be retained for certain pharmaceutical uses, such as solvents, preservatives, etc., if the practice

of pharmacy is to continue throughout the war, and the pharmacist's title to this portion is less likely to be questioned if he limits his requirements thereto and refrains from encroaching upon the domestic domain for substitute sweetening agents such as honey, molasses, glucose, etc. It is among the possibilities that domestic need for the latter may even become acute pending the termination of the war.

The foregoing thought suggests the chief objection to be found with the proposed plan of conserving drug supplies by adopting war-emergency formulas to be used in place of our official standards. Many of the suggested substitute formulas provide for the use of substances which are no more plentiful nor any less in demand than are the articles which they are designed to replace. This plan of conservation seems therefore a not altogether unselfish one. The second objection to war-emergency formulas lies in the cumbersomeness of the plan and the endless complications likely to result from extemporaneous prescription combinations of these more or less untried formulas. The final count against the plan is the fact that if it is to be successfully operated, precisely the same effort will be needed to enlist medical coöperation as in the writer's plan, without securing nearly as beneficial results.

As a concrete example of the potentialities of the conservation plan proposed by the writer, elixir terpin hydrate serves well. Only one four-ounce prescription for this preparation dispensed in each drug store in the United States consumes between seven and eight hundred gallons of alcohol, more than three tons of glycerin, and about one ton of syrup. If the active ingredient of the preparation, terpin hydrate, is administered according to the writer's suggestion, in powder, pill, or capsule form, there is saved to the country a volume of the ingredients composing the elixir proportionate to the number of prescriptions so changed. And therein lies the principle of conservation by coöperation with the medical profession. It presents an obligation for rational pharmacy and therapy. How shall the obligation be met?

ANEURISM TREATED BY WIRING, PERNICIOUS ANEMIA, DUODENAL ULCER, HYSTEROGENOUS ZONES, ASCITES, HYDROTHORAX—A CLINIC AT THE JEFFERSON MEDICAL COLLEGE HOSPITAL.

BY H. A. HARE, M.D.,
Professor of Therapeutics and Diagnosis in the Jefferson Medical College Hospital.

The first case I show you to-day is a man with an enormous thoracic aneurism, involving the entire aortic arch, which I operated upon two weeks ago by wiring and electrolysis and again forty-eight hours ago. As in all of the cases which I have treated by this method, it produced immediate relief of pain, so that the patient expressed the greatest satisfaction and was able to sleep as he had not been able to sleep for many weeks. Unfortunately, as I told you at that time, the difficulty in treating so large an aneurism is that you no sooner mattress, or buttress, a point which threatens to rupture than another point begins to give way, either by the natural course of events or because the wire and clot deflect the blood current so that it impinges upon the wall of the aorta elsewhere, which is almost as weak and diseased as at the point of operation. This occurred in the present patient. You perceive the growth is larger than it was two weeks ago in all of its dimensions. It now measures ten inches from side to side, and eight inches from below upward, and projects through the normal level of the chest at least four inches. You will notice the extraordinary distention of the abdominal veins, which are as large as the little finger of a man's hand, as a result of intrathoracic pressure. Two days ago, or twelve days after the first operation, a near-by point in the wall of the aneurism seemed so thin

and yielding that, so far as human foresight could foretell, it threatened to rupture at any time. It was ecchymotic and greatly discolored. For this reason I did not consider it wise to wait until to-day for the second operation, in order that you might see it, but introduced the second sixteen feet of wire and used electrolysis as before. I will leave it to the patient to describe to you, without prompting, his complete relief of the severe pain which returned a few days ago. (Here the patient volunteered that he had slept seven hours the last night and that he has had no discomfort except "a coughing spell.") The point to be remembered in this case is that wiring and electrolysis offers the only hope of prolonging life and, possibly more important, that it relieves pain and so avoids the continual use of morphine. Of course, an aneurism bulging posteriorly in such a way as to press upon the vertebral column cannot be treated by this means, but if it points posteriorly to one side of the vertebral column it can be treated by this method, as I have done on a number of occasions where the ribs near the spine have been eroded.

The next patient is he whom I presented to you about three months ago, a case of pernicious anemia. You will recall his intense pallor at that time, his shortness of breath, and the degree of feebleness which kept him in bed. You also will recall that repeated and careful blood examinations showed the characteristic blood picture of this disease, the small number of red cells, the presence of nucleated cells, poikilocytosis, and the other characteristics of the blood of pernicious anemia. You will also recall he failed to improve upon ascending doses of Fowler's solution, but before he left here I showed you at a later clinic that he had made a very extraordinary improvement upon hypodermic injections of a grain of cacodylate of sodium given every third or fourth day. The improvement was not only manifest to the ordinary observer, but there was great improvement in his blood picture. He was so well that he was anxious to leave the hospital. He returned to the hospital to-day, after an absence of seven weeks, and you will perceive that he looks actually ruddy. He expresses himself as feeling in perfect health, and says that he has had no treatment since he left here. This is a truthful statement, in one sense, but is probably not scientifically accurate. The reason that such large doses of cacodylate of sodium can be given is that it is a very stable compound and breaks up very slowly in the body, with the result that the arsenic is set free so gradually that it does not produce a toxic effect. In other words, while it is true that his injections ceased seven weeks ago his system is probably utilizing the arsenic distributed through the various foci of the cacodylate of sodium, which were made by the injections to which I have referred, thereby continuing his treatment involuntarily, so to speak. As he has just arrived at the hospital no opportunity has been offered to examine his blood, which will be done at once.

The examination shows that his red cells have increased from 1,340,000 on October 20th to 4,820,000 on February 1st.

The next patient is one of duodenal ulcer occurring in a young woman of twenty-three who, for some months, has suffered from epigastric pain which has been much more severe than it ordinarily is in this disease, often requiring an opiate for its relief, and being particularly severe at night so as to interfere with sleep. You will note that the point at which she has the most pain is not in the middle line but in the left-hand margin of the upper right quadrant of the abdomen. You must never forget that this zone is one in which disease frequently occurs, and when you have practiced for some years you will sometimes be surprised to find, when the abdomen is opened, that your diagnosis as to the exact condition present is erroneous. Disease of the gall-bladder, the pylorus, the duodenum, the pancreas, and the liver may be responsible for suffering in this part of the body, and, while the trouble may be so manifest that operative interference is essential and must be urged upon the patient, the exact cause of the difficulty

may be uncertain until the abdomen is opened. In this case, however, we have certain additional facts beyond pain in this region which aid us materially. First, the pain is relieved by taking food; second, an examination of the stools reveals occult blood at every test, and an examination of her stomach contents also reveals occult blood; furthermore, the *x*-ray examination shows the characteristic signs of an ulcer just outside of the pylorus. Because of her constant pain and the constant presence of occult blood, which shows that she is losing some of this vital fluid every day, and also because she is absolutely incapacitated for work and is in danger of a profuse hemorrhage, perforation, or ultimate malignant growth or the formation of adhesions, which will interfere with function, or ultimately make a cure by operation impossible, I have strongly advised her to submit to operation. She has consented, and immediately after this clinic will be transferred to Professor Da Costa's service.

I do not mean to tell you that all cases of gastric or duodenal ulcer should be operated upon. This is a matter which is still debated between physician and surgeon, and time does not suffice at this moment to enter into the pros and cons of this subject.

The next patient is an obese woman who some months ago was subjected to hysterectomy and oöphorectomy. Whether she was hysterical before this operation I do not know. I bring her before you to-day because she presents hysterogenous zones which are very rarely seen in this country, at least to the extent that she presents them. There is excessive tenderness in both ovarian regions and under each mammary gland, and pressure upon the point of exit of the infraorbital nerve induces a typical hysterical convulsion. Moderate pressure at this point causes the patient to go into a condition of opisthotonos with sighing respirations, and, as you perceive, sounds of hysterical laughter, although her face is that of a person in distress. You will also perceive that the administration of five minims of amyl nitrite speedily brings her back into a normal state so that she is able to sit up in her wheel chair.

The man that is now brought before you has an enormous accumulation of fluid in the abdomen, probably as the result of hepatic cirrhosis. The distention of the belly prevents a diagnosis as to the condition of the liver. In males such an accumulation is nearly always due to cirrhosis. In females you must never forget that an enormous ovarian cyst sometimes produces a condition practically identical in appearance. The latter should never be tapped; the former should be tapped and given relief from mechanical pressure, but in a case such as this it is unwise to drain the belly dry. The proper thing to do, in my opinion, to relieve pressure is to remove two or three quarts through the cannula and then to permit slow drainage through the dressing for as many hours as it will voluntarily drain. To drain completely with the cannula takes off so much pressure from the abdominal blood-vessels that a transudate rapidly reforms, and not only is this true but in all cases with much emaciation the patient may develop a dry tongue, stupor, coma, and death. This is not commonly met with, but nevertheless occurs with sufficient frequency to make one cautious. As the fluid comes out of the cannula you will notice that it is apparently a little bile-stained; if it was bloody it would indicate a probable malignant growth.

The last case is a man who has tuberculosis and the physical signs of effusion in the left chest. The apex beat of his heart is under his right nipple, and percussion over his left chest is dull or flat. There is also dulness in percussion in Traube's semilunar space, but the interspaces between the ribs on the left side are not as bulging as usual. One of my assistants, at my direction, attempted to aspirate, but the ribs were so tightly drawn together that the needle could not be gotten into the chest. I then took the needle, entered the chest cavity, and, much to my humiliation, got

a dry tap. Later the nurse who was attempting to clean the needle found that it was closed up by a plug of bone probably derived from the rib when my assistant had attempted aspiration. We will now attempt another exploratory aspiration—serum is at once obtained, proving that the clinical diagnosis is correct. I am not going to remove this fluid, however, except that which is taken in the exploratory puncture. As you know, many cases of pulmonary tuberculosis are now treated by artificial pneumothorax, which does good by putting the diseased lung at rest. I believe that in some cases of hydrothorax nature endeavors to put the diseased lung at rest, and that if we draw off the fluid we combat her efforts. If the displacement of this man's heart to the right gave discomfort, if there was evidence that other vital organs were impaired in their efficiency by the pressure, if he suffered from dyspnea, or if he was doing badly in general, I might think that ordinary evacuation of the chest by a hollow needle was wise, but he is in perfect comfort and has gained about a pound a week, and for this reason I have decided not to remove the fluid, at least at the present time.

A CONSIDERATION OF THE PRESENT OUTLOOK ON TUBERCULIN THERAPY.

To the *Southern Medical Journal* of February 1, 1918, RINGER contributes a paper in which he says that the advantages of tuberculin therapy, while not numerically great, appear well defined, and can be divided into two classes: (1) Direct advantages; and (2) indirect advantages.

The direct advantages are twofold:

(*a*) The first direct advantage is of course the effect of tuberculin upon the immunizing forces of the body, and by their stimulation and the induction of an active immunity, the lessening of toxemia and the amelioration of symptoms. To discuss this would necessitate mention in detail of the mode of action of tuberculin, which time would not permit, and which, moreover, would be out of place in a paper discussing the tuberculin situation. Suffice it to say that to tuberculin users the chief factor is the specific protein of the tubercle bacillus which is contained in any and all of the fifty odd members of the tuberculin family.

(*b*) The second direct advantage lies in the fact that there is a strong conviction among those familiar with the product that relapses are decidedly less frequent in patients treated with tuberculin than in those untreated.

The indirect advantages of tuberculin may be divided into three:

1. Tuberculin therapy exercises a marked psychic effect upon the patient. The patient feels that something is being done for him over and above the tiresome routine of bed rest or chair rest and limited exercise. The weekly or biweekly hypodermics produce a marked impression and act as a stimulus to take the cure more conscientiously.

2. Tuberculin therapy enables the physician to keep a closer watch over his patient (*a*) generally and (*b*) locally.

(*a*) It aids generally in that the patient is seen more often than would be the case were he not taking tuberculin, and therefore habits and mode of life can be more frequently investigated.

(*b*) It aids locally in that frequent examinations of the lung lesion become purposeful instead of being more or less perfunctory, and therefore slight changes are more apt to be detected and their significance appreciated.

3. Tuberculin therapy enables the patient to exercise more careful observation of himself.

Rest is usually enjoined for the twenty-four hours succeeding each dose, and temperature and pulse must be frequently and faithfully recorded. Dose days are definite, are not "movable feasts," and consequently many imprudent or thoughtless acts that the patient might commit are left undone because of a tuberculin dose.

It would not be justifiable to employ tuberculin for the single purpose of better

controlling the patient or in order to make him feel that something definite was being done for him. Sterile water under an assumed name would do just as well. But when over and above the actual physical advantages to be derived from tuberculin are present the adjuncts above mentioned, they have a right to play a rôle in the treatment of the patient if they play none in the treatment of the disease.

What must be the solution of the tuberculin question?

The solution must come about through the very clear realization of certain fundamental facts in connection with tuberculin and its administration. Some of these facts are:

1. Tuberculin must never be looked upon as other than an aid in the treatment of tuberculosis, must never be accorded first place, and must never be allowed to supplant, but only to supplement, a strict dietetic-hygienic régime.

2. Tuberculin must not be used by the inexperienced, as in their hands much harm can and will result.

3. Tuberculin must be used in a restricted number of cases and a good reason for using it must be present, a reason other and better than the mere fact that the patient has tuberculosis.

4. The dosage of tuberculin must not be regulated by rule of thumb, but must be highly individualized.

5. While opinions will differ on this point, the writer believes that in the long run the optimum and not the maximum dose should be sought, as it is a well-known fact that a large amount of tuberculin tolerance is not synonymous with the establishment of a high grade of immunity to tuberculosis.

6. Users of tuberculin must be on terms of intimacy with the physical signs presented by their tuberculous patients, and users of tuberculin must be familiar with the early signs of activity in the lung, whether of recent or recurrent origin.

7. Users of tuberculin must auscultate their tuberculous patients before practically every dose, as only by so doing will mild focal reactions be recognized and dosage governed accordingly.

8. Users of tuberculin must have before them a definite conception of what tuberculin can do, of its mode of operation, and of what is desired in each particular case.

9. The question of reactions must unfortunately vary with the view-point of the administrator of tuberculin. Opinions on this important point will continue to differ just as there exists controversy to-day over the administration of large or small doses of diphtheria antitoxin. No one will willingly produce violent systemic reactions, but the milder reactionary phenomena are desired by some and tabooed by others.

If men working with tuberculin, whether devoting their entire time to the treatment of tuberculosis or not, will bear in mind suggestions along the lines of those just mentioned, to which others equally or more valuable could doubtless easily be added, tuberculin therapy would be placed shortly upon a safer and a saner basis. Internal dissension in the ranks of tuberculin workers has done much to spread dissatisfaction among those not directly dealing with the product. It is highly necessary that tuberculin in the treatment of pulmonary tuberculosis be placed upon a sounder and surer foundation than that upon which it now rests in the opinion of the medical profession at large. The medical profession should not be willing to abandon tuberculin altogether any more than it should be willing that any or all of its members should administer tuberculin to each and every case of tuberculosis. Tuberculin is not a product to be used therapeutically by the general practitioner who has but two or three cases at a time to whom to administer it. Tuberculin is a product that will aid many cases when properly administered, and that, though by no means the specific with the curative powers that it was at one time supposed to possess, remains to-day the one biological product of value in the treatment not of the patient with tuberculosis, but of the disease: tubercle.

EDITORIAL.

BRACHIAL NEURITIS AND SCIATICA.

The general practitioner, as well as the specialist in nervous diseases, has good reason to dread the appearance of patients who make the complaint that they are suffering from either one of these conditions, since in many instances they respond to treatment so slowly as to cause much disappointment, and, not infrequently, the patient drifts from physician to physician without being materially improved. In some instances what is called brachial neuritis is really a bursitis. In other instances it depends upon some inflammatory or gouty deposit where the nerves take their exit from the spinal foramina; in still others, what is called brachial neuritis is really an arthritis of the shoulder-joint, and, in some instances, where a true neuritis is present, the cause is an injury or due to some occupational pursuit. For example, pain in the arm is now quite commonly suffered by women who are doing an excess of knitting. It is very doubtful, however, whether most of the cases which are considered neuritis really belong in this category, and without doubt any case of this nature, which is at all persistent, should be subjected to a careful *x*-ray examination to determine the presence of bursitis or arthritis. So, too, in regard to sciatica, it is becoming increasingly evident that a good many cases of sciatica, so-called, are neither sciatic neuralgia nor sciatic neuritis, but are in reality dependent upon some trouble in the hip-joint, in the sacroiliac joint, or trouble in the pelvic organs themselves.

For many years those who have been accustomed to studying these cases have separated the instances of sciatic neuralgia from true neuritis by flexing the thigh on the body, and then extending the leg on the thigh. If neuritis is present this is impossible without causing a great access of pain, whereas if the condition is neuralgic, which, however, is exceedingly rare, the extension of the leg on the thigh does not increase the patient's discomfort.

In all cases, whether the pain be in the arm or in the thigh, it is wise for the physician to remember that the underlying cause may be some local infection in the tonsils, the teeth, the pelvic organs in women, or the prostate.

Recently Patrick has called attention to another movement of the leg and thigh which, while it has been known before and employed by some, has not had the general use which it deserves for diagnostic purposes in disease of the hip-joint. This movement consists in placing the patient flat on the back, flexing the thigh, bending the leg on the thigh, and then abducting the thigh and placing the leg so that the external malleolus, or ankle, rests on the opposite limb just above the knee-cap. Such a movement does not greatly stretch the sciatic nerve, but it does involve certain changes in the position of the head of the femur, and so may reveal the presence of an arthritis of the hip-joint which is unsuspected. After the position which has just been described is assumed any attempt to depress the knee on the affected side will cause a great increase in discomfort or pain, whereas unless this depression on the knee is excessive no pain is felt in a healthy person. The advantage of this method is that it will reveal joint trouble in many cases in which mere flexion causes no discomfort. Occasionally in these patients firm pressure with the tip of the thumb along some part of the capsule of the joint will reveal a tender spot.

Patrick thinks it noteworthy that whereas striking the sole of the foot of the extended leg, whereby the head of the femur is driven into the acetabulum, is a valuable test in tuberculous hip-joint disease, in that it elicits pain in this condition, nevertheless in ordinary arthritis such a test is often useless in its results and, therefore, prone to deceive the physician. A point of importance to be remembered in applying the test just

described—that is, when the external malleolus is placed above the patella—is to see that the patient does not tip the pelvis, thereby preventing this posture from inducing pain.

Other points of diagnostic value which are brought forward by Patrick are that in arthritis the knee-jerk and Achilles jerk are not impaired, whereas in neuritis they are diminished or lost. If, however, there are arthritic changes in the spine so that the nerves at their points of exit are involved deep reflexes may be diminished.

These diagnostic aids being utilized, the question which naturally arises is what can be done for the relief of the patient? It is not possible to utilize a definite plan of treatment for each case, even if the diagnosis is accurately made. The cause which underlies the development of the symptoms must be discovered and removed, if it is still existent. Where neuralgia or neuritis is present the *x*-rays are to be used not only for diagnostic purposes but also because they frequently relieve pain, at least temporarily. In some cases the salicylates or the iodides do good. If anemia is present the iodide of iron, or Donovan's solution, is useful, and these drugs, particularly the latter, are of value if a subacute or chronic arthritis is present. If the arthritis is acute, they are probably useless. In acute cases the value of rest cannot be too strongly emphasized, but, in the shoulder-joint particularly, the grave question will arise as to whether disuse of the arm will not, while it relieves pain, nevertheless be followed by a certain amount of stiffness and immobility. If there are tender spots at the point of exit of the nerves from the vertebral foramina counter-irritation in the form of a blister often does good. When the pain is in the thigh or back and depends upon sacroiliac strain, rest is not only advantageous, but the employment of adhesive strips to put the part at rest is also advantageous. The old method of stretching the sciatic nerve in persistent sciatica seems to have gone largely out of practice. Possibly the good results which sometimes followed its employment depended more largely upon the rest which was necessary after the operation than upon the operation itself.

In some cases it is to be remembered, as pointed out by Taylor some years ago, that there are adhesions between the sheath of the sciatic nerve and the surrounding tissue, and the breaking up of these adhesions causes relief. Occasionally, where there is reason to believe that sciatic neuritis is present, several dry cups placed over the course of the sciatic nerve seem advantageous, and if the patient is of a distinctly gouty type the employment of colchicum and colocynth, as in the old-fashioned treatment of gout in the foot, proves advantageous.

ANOTHER CONSIDERATION OF SCOPOLAMINE-MORPHINE NARCOSIS IN CHILDBIRTH.

We believe that we have kept our readers fairly well informed in regard to the papers which have appeared for and against this method of producing what has popularly been called "twilight sleep" or painless childbirth. Not only in our Progress columns but in our editorial notes we have, from time to time, brought forward this matter, and we think it may be fairly stated that, notwithstanding the advantages which its advocates claim for it, the consensus of opinion of those best qualified to judge is strongly opposed to its use, and this opposition becomes particularly marked when the question concerning its employment in private practice arises.

Those who are interested in this subject may be fairly divided into three classes: Its hot advocates; those who state that its employment should be in an institution where the patient can be carefully watched and where absolute quiet can be obtained; and, lastly, those who do not think that the method is permissible under any circumstances, and we believe that the majority, if not all, of the teachers of obstetrics in this country belong to the latter class.

In view of the very natural desire upon the part of the laity, and upon the part of the medical profession, that some means

may be found whereby the pain of childbirth may be modified, it is not surprising that the subject of scopolamine-morphine narcosis should continue to receive attention in medical journals, although it would appear that nitrous-oxide-oxygen anesthesia is drawing ahead of it in popularity.

Our readers will be interested in a number of contributions which have been recently made from English hospitals in regard to so-called "twilight sleep" in obstetrics. In a recent issue of the *British Medical Journal* we find a report from St. Bartholomew's Hospital upon twenty cases. The initial dose was morphine 1/4 grain and scopolamine 1/150 grain. This was given when the cervix was dilated sufficiently to admit the finger, and, as a rule, when the pains were recurring at intervals of not less than one-quarter of an hour. One hour after the initial dose 1/400 grain scopolamine was given, and twenty minutes later an object with which the patient was not familiar was shown to her to identify. The great difficulty with these tests is that each time they are employed the patient is aroused, and absolute quiet is essential. The Babinski reflex and the pupilary pain reflex proved of no value. The result of this plan of treatment was that little effect on pain was produced in the first stage if the pains were in evidence before administration was commenced. On the other hand, if the pains were weak, the injections sometimes led to their entire cessation, and the reporter, Williamson, is therefore in accord with Gauss that in uterine inertia scopolamine-morphine narcosis should be avoided. He also found that the second stage was markedly prolonged, particularly in primiparæ, due to lack of expulsory effort. The third stage was also prolonged, but there was no severe postpartum hemorrhage, although in three cases there was temporary relaxation of the uterus four or five hours after delivery. Forty-five per cent of the patients were delivered artificially, which is certainly a high percentage. In other words, the scopolamine-morphine method increased the number of instrumental deliveries. Thirst was complained of by almost every patient. Nausea and vomiting were present in four cases and retention of urine was present in six cases. Restlessness occurred during the induction of analgesia. It was marked in twelve of the patients, slight in five, and absent in three, no definite relationship being established between the degree of analgesia and that of amnesia. In twenty-five per cent of the cases the entire course of the labor was clearly remembered. As to the child, one out of the twenty was still-born, but this was not attributed to the treatment. Of the remaining nineteen, eight were born in a condition of cyanosis, which was not, however, severe enough to give alarm. There was no evidence that the scopolamine was excreted in the milk, nor was lactation impaired.

The report from St. Thomas's Hospital covered eighty cases, hyoscine being used in the dose of 1/300 of a grain and morphine 1/4 of a grain. Sixty of the cases were primiparæ and twenty were multiparæ, and the number of injections necessary varied from one to nineteen. In this hospital Fairbairn found the memory test quite useless, the prick of the hypodermic needle in subsequent injections being a more useful guide. The hyoscine was given hourly. Complete analgesia was obtained in thirty-six cases, partial analgesia in forty cases, and no analgesia in four cases, so that Fairbairn's results are about equivalent to those of Williamson. Thirst was present in seventy-five per cent of the cases, and flushing of the face in ninety per cent, but no dangerous effects in the mother were observed. There was, however, a fairly constant diminution in the strength and frequency of the uterine contractions, after the first injection, sometimes lasting an hour or two. Bearing-down efforts were present in fifty-five, feeble in ten, and absent in fifteen cases. There was a tendency to delay in the latter part of the second stage, and an increase in the number of forceps deliveries, which were more than three times the average in that hospital. Bleeding was also greater than usual, and in four of the cases the bleeding was described as post-

partum hemorrhage. Three of the eighty children were still-born. In nineteen cases the child did not breathe or cry spontaneously at birth. In sixteen the child was blue.

Effects which were practically identical in nature were obtained in the General Lying-in Hospital in twenty cases. In one-fourth of these artificial respiration for the infant was necessary.

At Queen Charlotte's Hospital sixty-seven cases were treated. Here the results were better. Ninety per cent of the patients had a diminution of pain, but analgesia was complete in only thirty-two. Although labor in patients in this institution did not seem to be materially prolonged, the number of forceps deliveries was high. There were two cases of post-partum hemorrhage, one of which, however, was due to adherent placenta. In thirteen cases the baby was cyanotic, but in one only was there any cause for alarm about its condition.

One hundred and thirty-five cases are reported by Ley from the London Lying-in Hospital, made up of one hundred and twenty-eight primiparæ and seven multiparæ. The first injection was not given in this institution until the cervix was dilated two fingers and the pains strong and regular. The doses of scopolamine were given at hourly intervals. In this institution the number of injections varied from one to fifty-three, average over thirteen, and morphine had to be repeated in one-sixth-grain doses in seven cases. Catheterization was, as a rule, necessary during labor. Here, again, prolongation of the second stage was noted. The number of forceps cases was increased and perineal tears were greatly in excess, due to difficulty in controlling the patient when the head was on the perineum. There was an increase in the failures of occipitoposterior positions to undergo spontaneous rotation. The third stage was unaffected. The effect upon the infant was not noteworthy, although there seemed in many of them a disinclination to breathe. The conclusions reached by this reporter, Ley, and his colleague, Berkeley, are that the condition of the baby may cause grave anxiety to the inexperienced, and deaths are likely to be produced by too vigorous treatment of the child; that the constant attendance of the doctor and hospital nurse is necessary; that the necessity for nurses skilled in this line of treatment cannot be too forcibly impressed on patient and friends; that the treatment requires considerable experience, both of the method itself and midwifery; and they state that it appears probable that it should be withheld in all cases except those in which the capacity of the patient for bearing pain is greatly below the normal and is increased early in labor.

These conclusions, combined with the statement of Blacker that hyoscine is a dangerous drug, owing to idiosyncrasy toward it on the part of certain people, and the further statement of Williamson that although the method is valuable in suitable and selected cases it should be administered only after every precaution has been taken and only by those who are competent to deal with any obstetric emergency which may arise, seem to us to pretty well sum up the views which we should hold in regard to this interesting and important subject.

ALCOHOL AND HUMAN METABOLISM.

Under this heading the *Boston Medical and Surgical Journal* has recently published an editorial note upon the medicinal use of alcohol characterized by such safe and sane views that it deserves further attention. The first sentence is noteworthy, although we fear that some physicians, who have not used alcohol properly and who mix the social aspect of its employment with its medicinal value, will not agree with it. This sentence reads: "No one now doubts the value of alcohol in medicine, and its loss would be almost irreparable." These words should be constantly borne in mind by medical men who should in all their debates upon this important subject clearly recognize that while laws designed to prevent the use of alcohol by healthy persons may be wise, these laws should be so molded that

they will not interfere with the production and use of alcohol of proper quality in the treatment of disease. In certain types of sepsis and other infections, and at times in typhoid fever, in pneumonia, and in diabetes, alcohol has just as definite and clearly defined a field of usefulness as morphine or cocaine have when they are properly employed. It would be manifestly improper to deprive human beings of these pain-relieving agents in an endeavor to prevent their abuse, and so it is improper to prevent the production of preparations of alcohol which may be used medicinally in combating disease.

Further on in the editorial to which we have referred, the writer is fair enough to point out that although it is difficult to demonstrate any tangible harm from the consumption of moderate amounts as a luxury, nevertheless this use of the drug may very readily result in its abuse; and, again, it is pointed out that nearly all life insurance tables point to longer life in total abstainers.

It is not, however, with the social aspects of alcohol that we wish to deal. We wish to call attention once more to the fact that alcohol is consumed in the body and in its consumption provides heat and energy, and not only this, but by its ready consumption it prevents the breaking down of highly organized protein tissue and fats. This is one of the reasons why alcohol is unnecessary as a beverage for healthy persons, whose metabolism may be disturbed or disordered by it, whereas in persons suffering from disease its employment is entirely proper.

What has been said so far holds true of the stronger alcoholic beverages. These should be clearly separated from the weaker ones, which, in turn, have very little value in disease because of their small content of alcohol, but, nevertheless, possess a value in that they allay thirst, are refreshing, and possess some nutritional value. This nutritional value, however, is not found along the lines heretofore considered by most persons, for the quantity of foodstuff contained in beer, or even in one of the heavier malt liquors, is so small as to be a factor of no value.

The editorial to which we have referred calls attention to the fact, not generally known, that it has been demonstrated, as published in the Hygiene Laboratory Bulletin of the U. S. Government for February 18, 1916, that beer contains a very large amount of vitamine substances, and therefore possesses a food value because of this content which has hitherto been unsuspected. The *Boston Medical and Surgical Journal* therefore points out that when foods containing much vitamine, such as meat, milk, eggs, etc., are high-priced, the demand by the poor for beverages containing vitamines can readily be understood. The production of a beer with a low alcohol content is, therefore, not to be condemned in times of stress, but encouraged.

It is an interesting fact that human beings all over the world are prone by instinct to employ certain substances, day in and day out, without being able to explain their action by any other statement than they like them, whereas modern science can at least in part reveal the real reason. The universal use by hundreds of millions of people of plants containing caffeine, or nearly related substances, is explained by scientific investigation, which reveals the fact that these substances increase efficiency and diminish tissue waste, provided they are properly used. There is some evidence that this is true also of tobacco. It is true of alcohol, and to some extent it is true of opium, for it will be remembered that a British Royal Commission reported that in India the universal use of opium seemed to be essential to a certain class of the population which by necessity was underfed. It would appear that we are approaching the time when the medical profession, in order to protect its abilities to combat disease, must see to it that too radical legislation is not enacted. Laboratory investigations must be employed to explain certain facts in order that the use of strong or weak alcoholic fluids may be wisely controlled and rationally resorted to.

RADIUM, X-RAYS, AND CANCER.

In the fifth annual report of the Collis P. Huntington Memorial Hospital for Cancer Research in the various departments of the Cancer Commission of Harvard University, it is noted that a plant has been established which represents a valuation of about $600,000, involves an actual expenditure of nearly $50,000, and embodies a hospital of twenty-five beds.

The chairman observes that scientific research of world-wide distribution has thus far failed to discover any organism which could place cancer upon the list of diseases of microbic origin.

Allusion is made to Professor Duane's work, tending toward the perfecting of high-frequency and high-generating plants to be used with Coolidge *x*-ray tubes, the expectation being that an agent will be obtained which represents the efficiency of several grammes of radium. The hope is expressed that Dr. Little's studies in genetics, illustrated by the observation of hereditary tendencies in some of the smaller animals, to-wit, mice, may help to solve the question of susceptibility to cancer of certain families. It is also granted that the solution of the cancer question may prove to be a chemical one. It is reported that the amount of radium has been more than doubled during the past year and now amounts to 1 gramme, representing a value of about one hundred thousand dollars.

It is stated that the Commission has shown during the past year a slow but steady advance toward the solution of the proper method of treating cancer. It is further shown that in the years 1916-1917 there were 571 new cases brought to the hospital, and that there were 4488 outpatient department visits, for which the operative expenses were very little short of $30,000, the hospital earnings being about half this sum. The small percentage of sarcomas is noteworthy in the tabulated report. It is noted that the combination of operative treatment and radium therapy has been proved to be useful in many cases of advanced cancer.

There is in this report a brief reference by Professor Duane to his part of the work, which indeed seems of major importance. He states that on the average about 48 patients a week have been seen, and that most of the tumors treated belong to the superficial skin types of cancer. He seems to be well assured that an *x*-ray plant may be constructed which will produce rays approaching in penetration to the camera rays of radium.

Bovee contributes some quantitative studies of changes in physiological processes in tissues subsequent to radiation. He has developed a method for following quantitatively the permeability changes resulting from radiation, by observing variations in the resistance of the protoplasm to the passage of an electric current. By this method he has been able to follow the changes both during and after radiation, and it has been possible to divide the changes caused by radiation into two distinct categories: one is the direct result of the radiation, and the other is a catenary of changes resulting from the initial change. The latter continues after the exposure, and proceeds at a rate which is more or less proportional to the amount of radiation.

He found that tissues which had been radiated were sensitized to heat so that they were destroyed by temperatures which had no effect on normal tissues. A comparison of the rate of cell division in radiated animals with that of controls disclosed no indication of a reduction in the ability of the cells to divide. In other words, organisms which did not die within a few hours after radiation showed no change in division rate.

It was further found that an organism can recover from a half-lethal dose in one hour, so that a second half-lethal dose does not kill.

Bovee further announces that gelatine loses its ability to jell by exposure to ultraviolet radiation. This fact is significant in connection with the photocoagulation of proteins demonstrating photochemical change resulting from exposing proteins to the light has a marked effect upon their

degree of hydration. This is undoubtedly the cause of some of the visible changes which may be observed in radiated protoplasm.

Little has directed his energies toward the production of deciduoma in the uterus of a rat after the implantation of macerated embryonic chick tissue. He noted the persistence and differentiation for nine days of cartilaginous embryonic chick tissue under the skin of mice, and observed that the uterus of the female mouse, insusceptible to subcutaneous implants of a given tumor, is not a favorable field for tumor growth, even though inoculated at a period following gestation, which made certain that the uterus was in a receptive condition. Further, that certain of the hereditary factors producing immunity to inoculated tumors of the Japanese waltzing mouse are developed after the birth of the young.

The busy surgeon or practitioner who lays down this report without the feeling that it is a record of great activity, astonishing ingenuity, and almost superhuman hope and patience would be wrong if he ends with this as his final summation. Duane's work has blazed a new trail, and of itself is already of great clinical value. Of the other researches little can be said, excepting that they are all potentially valuable and would appeal forcibly to the optimist.

TREATMENT OF SYPHILIS.

After the first burst of enthusiasm concerning the arsenical treatment of syphilis, based on a belief in its power to eradicate and completely cure if given in sufficiently large doses, came a reactionary period during which this drug was given with that care which should be accorded a toxic substance, in comparatively small doses and at safe intervals; the effort to cure being based on a frequently repeated moderate effect rather than on a complete and overwhelming one from the start. Because of many recurrences and a persistent Wassermann reaction there has been a growing tendency to administer larger and more frequently repeated doses, and, with intervals of rest, to continue this treatment until laboratory tests show it is no longer indicated.

In one portion of our army the routine treatment is as follows: The drugs used are novarsenobenzol, cyanide of mercury in one-per-cent solution in ampoules of 1 Cc., and gray oil containing 40 per cent of mercury.

Given a person presenting himself with primary or early secondary lesions, in the course of forty-two days there are administered eight injections of novarsenobenzol (914), beginning with a dose of 0.30 and finishing with one of 0.90; twenty-one injections of cyanide of mercury, each containing 0.01 grm. and two injections of gray oil, each 0.10 grm. Thereafter there is a thirty days' rest; followed in the next month by five injections of novarsenobenzol, the first 0.45, the last 0.90, and five injections of gray oil, each 0.1. Thereafter two and a half months' rest. At the end of six months from the beginning of treatment a Wassermann reaction of the blood and spinal fluid. At the end of the seventh month a repetition of the second course regardless of the Wassermann. Thereafter three months' rest. Then a fourth course the same as the second. After a four months' rest a Wassermann, which, if negative, calls for no treatment. Positive Wassermann calls for a repetition of the second course. Four months later a Wassermann again with the indications as before; and five months later (that is, at the end of the second year) a Wassermann with indications as before.

A 3-Cc. glass syringe is employed, the novarsenobenzol being dissolved in its containing ampoule by sterile water poured into it from another ampoule, the syringe being loaded through its needle.

The initial dose is reduced in syphilitic nephritis, cardiovascular disease, lesions of the central nervous system, very nervous patients, women, and small men.

The contraindications are uremia, marked cardiac decompensation, and non-syphilitic

cachexia. It is noted that jaundice after the first dose may end in acute yellow atrophy of the liver.

The reactions observed may be slight and transitory, or severe and lasting, and may be characterized by nausea and vomiting, skin eruptions, headache, or conjunctivitis. The second dose of the arsenic should not be given until the reaction entirely disappears, and should be preceded, when any reaction has occurred, by 15 drops of 1-to-10,000 adrenalin solution. At times there is an immediate flushing of the face, with a congestion of the conjunctiva and a feeling of fulness and irritation of the throat, attended by coughing and ringing in the ears. This condition is usually transient and apparently vanishes more quickly after an injection of 1:10,000 adrenalin solution. When the patient complains of a sweet taste or a taste of ether after the first dose, adrenalin should be given before the second. Some patients complain of pain over the lumbar region shortly after the first injection. This may pass away or may be followed by complete prostration with loss of consciousness, and an extremely feeble pulse. Recumbent posture and warmth are indicated. Occasionally cases of acute encephalitis develop after the second injection; such patients have usually exhibited a marked reaction after the first injection. Exceptionally there is either transient or more or less permanent palsy of the nerves.

As to the mercury, colic, indigestion or salivation are indications for the immediate cessation of the treatment.

The spinal fluid is examined in all cases showing clinical involvement of the nervous system; those suffering from headache at night, or from eye symptoms; in all cases in the fourth month following infection; and in all patients in any stage of the disease showing a three or four plus Wassermann.

Cases not seen till the disease is in its more advanced stages are given six to ten doses of arsenobenzol, followed by mercury for six weeks; thereafter resumption of novarsenobenzol with mercury, followed again by mercury for another six weeks. Following this after a two months' rest the blood is examined; if negative, mercury is kept up for another two months, followed, after two weeks' rest, by a further Wassermann test. If this is negative the arsenobenzol is discontinued, but mercury is kept up for two months. Then no treatment for two weeks and another Wassermann. If it is negative the treatment is discontinued, but the blood is examined every two months. If positive 5 to 7 arsenobenzol treatments are given and mercury continuously, preferably by the mouth.

The course recommended for use in the French army is based on the thought that by proper dosage the soldier may be early returned to duty, and may be permanently cured of his infection. Eight intravenous injections of 914 are administered in increasing doses at intervals of six days, the patient being in the hospital. In addition to this 42 injections of the soluble salt of mercury or 50 inunctions are administered. At the end of this course, which lasts seven weeks, the patient returns to his corps. One month later he commences to take pills of protiodide of mercury 0.05 gramme with extract of opium, one of which is taken for the first ten days of every month for a year.

The minimum course prescribed at Rochester Row to average early cases in the British army at the present moment is seven doses of 606, beginning with 0.3 grm. and ending with 0.5 grm., and eight intramuscular injections of mercurial cream, each containing 1.0 grm. in the first fifty days. Thereafter a Wassermann test, which if not completely negative is followed by potassium iodide for two weeks. Thereafter three doses of 606 and an equal number of injections of mercurial cream in the next month. If the blood is still positive, a series of short courses is prescribed of three doses of 606 and the same number of injections of mercurial cream, with about a month's interval between the courses; or chronic mercurial treatment may be ordered.

In tertiary, late secondary, and all old recurrent cases in which the previous treatment has been scanty and the Wassermann reaction is strongly positive, at the time the patient appears for treatment no particular attention is paid to the Wassermann reaction on the fifty-second day since there is little hope of obtaining a lasting negative at this stage. Providing all lesions have healed by the fiftieth day, which is practically always the case, the further treatment generally advised is a series of short courses of 606 and mercury. The main principle for guidance is that the treatment must be prolonged over a number of years.

It will be noted that in all three armies the treatment is vigorous and prolonged. For the ultimate good of humanity at large there is now being collected an enormous clinical material upon which may be built a sure foundation of safe treatment and, possibly, of efficient cure.

REPORTS ON THERAPEUTIC PROGRESS.

ELECTROCARDIOGRAPHIC OBSERVATIONS IN TOXIC GOITRE.

To the *American Journal of the Medical Sciences* for February, 1918, KRUMBHAAR contributes a paper on this subject.

Electrocardiographic studies have been made of 51 cases of goitre, mostly of the toxic type, in as many cases as possible both before and after surgical operation.

In the series of 47 patients that submitted to surgical operation (ligation, partial excision, and enucleation of adenomata) three deaths occurred. Two of these offered no premonitory sign in either clinical or electrocardiographic examination; in the third case the development of negative T-waves might have served as an adequate warning.

Electrocardiograms, essentially normal as to form and rhythm, were found in 22 cases (43 per cent). Preponderating hypertrophy of the right ventricle (or a tendency thereto) was found in 11 cases, and of the left ventricle (or a tendency thereto) also in 11 cases. After operation, however, one-half of the right ventricular cases showed a diminished degree of preponderance, whereas all but one of the left ventricular cases showed either no change or an increased amount of preponderance.

Cardiac arrhythmia was found as follows: sinus arrhythmia, 4 cases; ventricular extrasystoles, 3 cases; auricular fibrillation, 3 cases; auricular flutter, 1 case; delayed conductivity, 2 cases. Two of the cases of fibrillation and the case of flutter proved constant over several years. The other case of fibrillation was of the transient kind and disappeared coincidentally with the improvement that followed medical treatment.

The T-wave was found to be unusually prominent in most cases. In about half the cases it was markedly and persistently diminished after operation. This was found to be true to a less degree in postoperative cases with normal hearts. Other changes in form of the ventricular complex after operation indicated an approximation to normal cardiac mechanism.

Blood-pressure estimation showed an increased pulse-pressure in most cases, which was diminished with the improvement that followed surgical relief. Systolic pressure was also high in those cases that showed left ventricular preponderance, but never exceeded 170 mm. Hg.

In the early cases of toxic goitre the characteristic tachycardia is not accompanied by any signs of myocardial change that are demonstrable with the string galvanometer.

With persisting overaction of the heart, hypertrophy of either ventricle may become manifest.

Progressive hypertrophy and overaction result in myocardial degeneration that may be manifested by any type of cardiac irreg-

ularity: sinus arrhythmia, premature contractions, auricular flutter, auricular fibrillation, heart-block, etc.

If the existing intoxication is the chief factor in the production of the arrhythmia this may disappear with removal of the intoxication.

Successful treatment, whether medical or surgical, improves the cardiac condition by this means. This is shown not only by the occasional disappearance of an arrhythmia but also by diminution in the size of the T-wave and in the pulse-pressure as well as by the general clinical condition.

The development of diphasic or inverted T-waves should probably be considered as influencing prognosis unfavorably.

THE BLOOD AND CEREBROSPINAL FLUID IN THREE HUNDRED KNOWN CASES OF SYPHILIS.

DENNIE and SMITH in the *American Journal of Syphilis* for January, 1918, reach these conclusions from an examination of three hundred cases of syphilis:

1. In primary syphilis, the cerebrospinal fluid was entirely negative in 80 per cent of the cases, and of the remaining 20 per cent the findings were very mild.

2. In secondary syphilis, the cerebrospinal fluid was entirely negative in 45 per cent, 35 per cent had mild reactions, and 20 per cent marked findings.

3. In late secondary syphilis, the blood Wassermanns were 100-per-cent positive; 60 per cent gave undoubted evidence of meningeal involvement as the cerebrospinal fluid in these cases was markedly positive throughout; 33 per cent had moderate findings in the cerebrospinal fluids; and only 7 per cent had entirely negative cerebrospinal fluids.

4. Early treated cases of syphilis should have an examination of the cerebrospinal fluid before the treatment is finished, as 50 per cent of the series reported here had positive findings in the cerebrospinal fluid without signs or symptoms of central nervous system involvement.

5. Cerebrospinal meningitis (syphilitic, acute) had the same findings in the cerebrospinal fluid, even to the paretic curve with the gold solution as paresis.

6. Cases of gummata of the penis did not have marked findings in the cerebrospinal fluid, but they were of a confirmatory type.

7. The phagedenic ulcers reported here were evidently due to latent syphilis.

8. Old syphilis without symptoms, treated and untreated, has almost the same findings in the blood and cerebrospinal fluid. One-third showed confirmatory evidence of syphilis in the cerebrospinal fluid.

9. Syphilis of the tongue, stomach, and liver did not show any evidence of syphilis in the cerebrospinal fluid.

10. The larger percentage of syphilis of the bones and joints shows confirmatory evidence of lues in the cerebrospinal fluid.

11. Fifty per cent of the cases with syphilis of the skin (old) showed marked evidence of syphilis in the cerebrospinal fluid. This report is decidedly against the old teaching.

12. Raynaud's disease should always be investigated for old syphilis.

13. Congenital syphilis did not show many positive cerebrospinal fluids.

14. In syphilis of the arteries (aortitis, aneurism) all showed positive cerebrospinal fluids.

15. Patients with optic atrophy all had positive cerebrospinal fluids (evidence of a meningeal involvement).

16. Brain syphilis of the vascular type had mild findings in the cerebrospinal fluid. The chronic basilar meningitic type had marked findings in the cerebrospinal fluid.

17. In cerebrospinal meningitis (old), without signs, 64 per cent had marked findings in the cerebrospinal fluid, and 28 mild findings; the rest were negative.

18. In paresis all the findings were marked.

19. Transverse myelitis, multiple sclerosis, and progressive muscular atrophy should always be investigated for syphilis.

20. Tabes dorsalis was divided into five groups: (1) Marked findings in both blood and cerebrospinal fluid. (2) Positive blood

and mild findings in the fluid. (3) Positive blood and negative spinal fluid. (4) Negative blood and positive spinal fluid, and those showing the paretic curve.

21. The intensity of the serologic findings is an index to the activity of the syphilis.

22. The so-called paretic curve may occur in any Lange test, no matter what type of activity, if the process is very active.

A PRELIMINARY REPORT OF TWO AND ONE-HALF YEARS' EXPERIENCE IN THE USE OF EMETINE HYDROCHLORIDE IN INOPERABLE CANCER.

VAN HOOSEN in the *Woman's Medical Journal* for January, 1918, in reporting a series of cases states that the injection of emetine directly into the carcinomatous tissue was not followed with any results suggestive of improvement in any respect. The use of small doses—½ grain and 1 grain—has been entirely discontinued, and the only dosage she uses at present is 4 to 8 grains daily in two-grain doses. Eight grains in two-grain doses every two hours for four hours does not produce any uncomfortable or dangerous symptoms in carcinomatous patients. The hardening noticed in the tissues seems to be due to a fibrosis set up by the selective action of the emetine on the carcinomatous tissue.

No claim is made in this report that emetine cures or will cure carcinoma. One or two years of health following some form of treatment has been reported again and again, and yet satistics give a constantly increasing toll of cancer victims. Although the parasitic theory is not popular, it is, however, hoped that this report may stimulate physicians to use and observe the action of emetine in carcinoma, not only because it will render comfort to inoperable cases by freeing them from pain, odor, and hemorrhage, but because it will enable the surgeon to enlarge the field of operations on carcinoma patients and give a chance to many who are at present doomed to an unsuccessful palliative treatment.

[These large doses of emetine when given in dysentery have been known to cause very alarming symptoms.—ED.]

ON THE ABSORPTION OF DRUGS AND POISONS THROUGH THE VAGINA.

In the *Journal of Pharmacology and Experimental Therapeutics* for January, 1918, MACHT reaches these conclusions:

1. It has been shown that a large number of drugs and poisons—alkaloids, inorganic salts, esters, and antiseptics—can be and are absorbed through the vaginal wall.

2. Such absorption can be demonstrated experimentally by physiological and chemical means.

3. A review of the clinical and toxicological literature shows that poisoning through the vagina, of a grave character, is not very rare.

4. His experiments indicate, on the one hand, the possibility of administering drugs therapeutically for their constitutional effects, through the vaginal route; and on the other hand emphasize the great danger of the indiscriminate employment of various poisonous substances in the form of douches, tampons, "uterine wafers," etc.

CERVICAL GLANDULAR ENLARGEMENT IN CHILDREN, AS EVIDENCE OF INFECTION.

In the *British Journal of Children's Diseases* for October-December, 1917, GUNSON reaches these conclusions:

1. Glandular enlargement is evidence of an infective process situated in the lymphoid tissue specifically drained by such glands. The flow of the lymph from the infected tissue is in one direction only, and each gland drains a definite and restricted area, the tonsillar lymphatics, *e.g.*, passing directly to the tonsillar gland.

2. In the majority of cases of chronic cervical glandular enlargement the associated infection is simple in nature and quickly responds to appropriate treatment, the glandular enlargement subsiding as soon as the infective process is removed. Four-

teen per cent of scarlet fever patients, however, on discharge from hospital presented evidence of persistent throat infection (evidenced by glandular enlargement) in spite of energetic treatment.

3. Persistent cervical glandular enlargement in the course of scarlet fever was found to be associated with severe constitutional symptoms, and complications which included nephritis and arthritis.

4. When chronic cervical glandular enlargement persists in spite of local treatment of the throat, the lymphoid tissue involved (*e.g.*, tonsils) is frequently the seat of a tuberculous lesion, the glands being secondarily infected.

5. Simple chronic glandular enlargement in young children is associated with malnutrition, and alimentary and respiratory disorders. When the glandular enlargement persists into adolescence, or develops, these patients suffer from apathy, exhaustion, and dyspnea on slight exertion. The symptoms are sufficiently severe to suggest cardiac disease, which careful examination fails to reveal. This association is so important that it indicates early and complete treatment—directed to the infective focus—in all cases of cervical glandular enlargement, including operative measures when required.

PRACTICAL INFANT FEEDING.

In the course of an article in the *New York State Journal of Medicine* for January, 1918, JOHNSON states that cow's milk mixture leaves the stomach in the following order: First, the whey, containing most of the sugar. This is physiological, as its digestion is done chiefly in the small intestine and therefore early gets out of the stomach. Then follows the fat as it is liberated from the meshes of the casein; and lastly, the casein itself.

In the normal infant's stomach casein of mother's milk is a fine, flocculent mass, whereas the casein of cow's milk forms large, tough masses. Many methods are used to break up these curds. Alkalies, such as sodium bicarbonate, sodium citrate, and lime-water, are given. The first two inhibit in part the coagulation of the casein by precipitation of the calcium. The last, if added in larger quantities than is usual, causes a fine subdivision of the casein. Milk so treated is enabled to leave the stomach sooner and thus pass into the intestine in a fluid condition. The addition of alkalies should not be a routine measure; indeed, it is seldom, if ever, required, if the milk is boiled or where a cereal diluent is used instead of water.

The peptonizing of milk has failed to a large degree in aiding digestion and has consequently become unpopular.

The feeding of split proteid (whey, cream, and sugar mixtures) is as impractical as it is needless.

Boiling milk not only makes the proteid more easy of digestion by breaking up the curd, but likewise destroys all harmful bacteria. Tough, large proteid masses remain undigested in the stomach for hours, when raw milk is taken, and when not vomited often escapes in the stools as such. If the milk is boiled—say three minutes—these curds become flocculent and easy of digestion and are not found in the stools. Johnson does not believe there is conclusive proof that boiled milk is an inadequate food for infants, providing its use is maintained only during the early months, while there is abundant clinical evidence that it is easier of digestion, as well as safer. Later, when the infant is older and the digestive functions have become accustomed to cow's milk, Johnson uses it raw. The prevalent idea that boiled milk is constipating is greatly overstated.

That there is a tendency on the part of boiled or pasteurized milk to produce some of the nutritional diseases is evident, but these disturbances seldom occur if the heated milk is used for only a limited time. The destruction of disease-producing bacteria by boiling the milk greatly overbalances any temporary nutritional disorder.

There is a wide-spread idea that pasteurizing milk renders it harmless as a food, even when given for a long time. This is not quite true, as scurvy is fairly often seen

in cases thus fed. Within a few weeks Johnson has seen two such: one having the food for nine months, the other for seven.

As an antiscorbutic every artificially fed infant past three months of age should be given orange juice, and preferably without sugar.

It has been shown that under normal conditions it requires two to three hours for all the milk of any one meal to leave the stomach. There should be an interval of digestive rest before the next meal is given. Seven meals in twenty-four hours are sufficient up to the fourth or fifth month, given at six, nine, twelve, three, six, ten, and two, and then six meals up to ten months; thereafter, five meals in twenty-four hours. Many children do better during their second year with only four meals.

Forty to forty-four ounces of fluid taken at meals should be the maximum at any age, and of milk one quart is usually sufficient. Too much milk after the first year disturbs the stomach, lessens the appetite, and supplies only about one-third to one-half the caloric value of our common foods, thereby underfeeding the child.

The digestive capacity of each infant must be determined by a close study of the individual child, its digestive history, weight, stools, etc. Considering that from 20 to 30 per cent of all infants are bottle-fed, that the problem of feeding rests largely with the mother and the general practitioner, would it not be wise to develop something of a uniform method practical in its application and efficient in its results?

FRESH LIGHT ON TETANUS PROBLEMS.

The *Lancet* of December 29, 1917, states statistically, what is to be said can be said briefly. Captain H. Greenwood admitted, in the debate at the Society of Tropical Medicine, a high degre of association between the use of prophylactic inoculation and the lengthening of the incubation period. Tetanus that takes long to develop as a rule gets well, and there is no need to look about for any other explanation of the diminished fatality than the prophylactic use of serum. But the association between large therapeutic doses of serum and the recovery-rate is not at all of the same order, and Sir David Bruce himself concludes that in regard to the therapeutic effect of antitoxic serum the evidence is still inconclusive. Prevention is, of course, better than cure, and in no disease more abundantly better than in tetanus, but the proportion of wounded men who continue to develop the disease in home hospitals is still put down at about 1 in 1000, and with the enormous size of the armies engaged the absolute number of cases of tetanus remains sufficiently serious to make the problem of first-rate importance.

Prophylactic injection, besides so notably diminishing the number of cases requiring therapeutic injection, has also produced a new form of tetanus, the study of which is greatly adding to our store of useful knowledge. The facts of local tetanus have already brought Ransom to the view that tetanus toxin does not enter the central nervous system by the lymphatic or blood channels, but passes exclusively along the motor nerves and through the protoplasm of the neurons themselves. The toxin in nerves and nerve cells is inaccessible to antitoxin. Antitoxin is transported by the lymph and blood; it is not taken up by the nerves, and there is no reason for thinking that it ever reaches the nerve cells. This appears to agree with the clinical facts in man, although not quite consistent with the experimental results obtained by Sherrington with antitetanus serum on monkeys. Using a dose of 2 mgm. toxin per kilo of monkeys and following this dose up after a period of from 47 days upward by an injection of 2000 U. S. A. units of antitoxic serum per kilo of monkey, Professor Sherrington was able to save the lives of 2 out of 25 monkeys by the subcutaneous route, 3 by the intramuscular route, 7 by the intravenous, and as many as 14 by the lumbar intrathecal route, and finally 13 out of 20 monkeys were saved by bulbar intrathecal injection. It would seem that under experimental conditions toxin which is already

firmly united to nerve cells can be detached by a sufficient concentration of antitoxin in the surrounding lymph spaces.

The other articles in the tetanus series all contain observations of practical significance. Cooper's account of more than 100 consecutive cases of tetanus in civil practice in India is useful as a control, inasmuch as there was in no case any chance of using antitoxin as a prophylactic. Many of his cases, too, had no external evidence of injury. Golla's lucid analysis of recent tetanus statistics gives the basis of mortality from the disease in pre-serum days and affords a further useful criterion for comparison. His figures also confirm the view that, apart from prophylaxis, serum treatment has so far not been shown to exert any influence on mortality. Salaman's notes on 10 cases illustrate the value of a particular sign—the loss of the swinging movements of the jaw—in the diagnosis of the developing disease. And, finally, Burrow's interesting case of splanchnic tetanus is a further illustration of Ransom's view that tetano-toxin combines with any nerve cells with which it comes in contact, and that its apparent preference for the motor neuron is only accidental, inasmuch as it is to the muscles that the tetanus bacilli gain access in gunshot injuries, whence the toxin passes up to the motor nerve cells. Systematic combined work of this nature will, we hope, soon lead to an increase in our knowledge of tetanus which will exert a beneficial effect on its treatment.

LACTIC ACID CULTURES IN THE TREATMENT OF DIFFICULT FEEDING CASES.

In the *New York State Journal of Medicine* for January, 1918, BOGERT asserts his belief in the view that the treatment of infections of the gastrointestinal tract in infancy and childhood is primarily one of diet. Upon the food ingested depend the growth and virulence of the organisms responsible. Morse, in an article upon "Infectious Diarrheas," has divided the microorganisms responsible, so far as the determination of the diet to be used in the treatment is concerned, into two groups: First, the various forms of dysentery and other organisms other than the gas bacillus; and, second, the gas bacillus and allied organisms.

The dysentery group feed upon a proteid or carbohydrate diet producing harmful products from the proteid, harmless for the carbohydrate. They, therefore, cease to cause trouble if proteids are withheld from the food.

The gas bacilli, on the other hand, thrive and cause disturbance where there is an excess of carbohydrate. Their growth is inhibited by lactic acid, and they cease to develop when a sufficient number of lactic-acid-producing organisms are present in the bowel.

In very acute cases one's attention is called to the infection by diarrhea. There is, however, a large group less acute or chronic in nature, occurring in both infancy and later childhood, in which diarrhea is not a prominent symptom or is absent altogether. These cases exhibit a marked toxemia, manifested in infancy by evidence of intestinal indigestion, colic, wasting, and alarming nervous disorders, including convulsions, and in later childhood by tardy physical development and various functional nervous disorders.

In a goodly number of these cases the gas bacillus seems to be the offending germ, and treatment directed to its elimination where the bacillus has been demonstrated in the stools is usually followed by complete recovery, often surprisingly rapid in its result.

Determination of the presence of the gas bacillus is an exceedingly simple procedure. A test-tube of milk, inoculated with a small portion of the stool, is placed upon a water-bath and the water is kept at the boiling point three minutes to kill all bacteria not in the spore state. The tube is then incubated at body temperature for eighteen to twenty-four hours, after which time the gas organism, if present, has dissolved the greater portion of the casein and the remaining casein is filled with bubbles of

gas. If a saccharometer is used for the incubation the gas rising to the top of the tube is more readily demonstrated. Not infrequently so much gas is produced that the milk is forced from the open end of the tube, practically nothing but gas remaining.

Colicky babies and infants, as well as older children, with severe chronic digestive disturbances, whose stools show distinct gas production upon culture, are in Bogert's experience almost invariably benefited by cultures of lactic acid bacilli, in frequent and full dosage. Undoubtedly in the milder infections, diet alone, lowering of the sugar and fat percentage of the food will suffice. The improvement, however, is apparently far slower.

On the other hand, cases showing similar symptoms but no gas have not as a rule responded.

THE TREATMENT OF WHOOPING-COUGH.

In the *New York State Journal of Medicine* for January, 1918, SHAW states that the value of the vaccines as a prophylactic measure is undeniable, and they should be administered to every child exposed to whooping-cough. Luttinger did not find a single severe reaction in over 3000 injections, and this has been the experience of the writer, who has administered large doses to infants six weeks old. It can therefore be stated that vaccines are harmless, do not produce severe reaction, and there is no danger of anaphylaxis. The dosage used for prophylaxis is the same as for the treatment, namely, five hundred million for the first injection, one billion for the second, two billion for the third, giving the injections every second or third day. Shaw has administered, with good results, one billion every two days for ten days.

The results from the vaccine in the treatment of cases already in the paroxysmal stage are not as striking as in prophylaxis, but the consensus of opinion is that where the proper vaccines are used there is a shortening of the paroxysmal stage, with a reduction in the number and severity of the paroxysms. A study of the use of vaccines in 112 cases of whooping-cough, in which this was the only treatment employed, shows that in 36 per cent of the cases in which the vaccines were given after the whoop developed, the course of the disease was shorter than the usual duration of the whooping stage—that is, thirty days—but with no effect on the number and severity of the paroxysms; in 52 per cent there were fewer paroxysms and of lessened severity, especially at night; in 12 per cent of cases there was no improvement observed, either in the course of the disease, its severity, or the number of paroxysms.

CLINICAL RESULTS WITH PHYLACOGEN.

FERGUSON in the *Charlotte Medical Journal* for January, 1918, reports his experiences in a number of patients and concludes his report by saying that his experience with phylacogen is sufficient to convince him that these agents are of great value in properly selected cases.

THE PROBLEM OF THE BIRTH CANAL IN OBSTETRICS.

Writing in the *Boston Medical and Surgical Journal* of January 17, 1918, DENORMANDIE well says that as the patient approaches full term the problem of the relative size of the baby to the mother's pelvis arises. This problem is present always in every primigravida and in any multigravida with a previous history of difficult labors, or when the baby in the present pregnancy is obviously much larger than in previous pregnancies.

Much has been written of the necessity of measuring the patient's pelvis previous to labor. It unquestionably should be done, for it is a guide, but that one can settle absolutely whether this or that baby can come through by measurement alone DeNormandie does not believe. Much more reliable than measurements alone is palpation of the fetus and the relation of its head to

the pelvic inlet. The more proficient the physician is in palpation, the less does he rely upon the measurements. If, before labor, by palpation the head is well down in the pelvis, there is no worry about the inlet of the pelvis, but if the head in a primigravida is high, it is necessary to do all we can to determine whether the head will come through the inlet or not. Of course in many cases the head can be forced readily into the pelvis, even if it is found to be high, but these are not the troublesome cases. Where the head is high and the question of disproportion—of overriding the symphysis—is present, how best can we answer that question? Place the patient on her back in the dorsal position and make a vaginal examination. Palpate the contour of the pelvis and try to reach the promontory of the sacrum. Then, after the pelvis has been explored with the two fingers of the left hand in the vagina, swing the thumb of this same left hand up over the symphysis and with the right hand grasp the fetal head and try to push it into the pelvis.

The fingers feel the descending head, if it will come down; the thumb feels the overriding at the symphysis if it is there, and if it is not, then it readily makes out the sulcus, if there is no disproportion. In many cases the head stays high and by the maneuvers cannot be pushed into the pelvis. Then if added pressure is made at the fundus, not infrequently the head can be pushed down to the lower border of the symphysis, and it is then fair to say that there is no real disproportion.

The inlet of the pelvis is more commonly the seat of contraction than the outlet, but the outlet is contracted often enough to demand careful examination in all primiparæ. Not all physicians carry with them the little outlet pelvimeter, but every physician has a fist which can always take the place of such a pelvimeter. The patient is still in the dorsal position; the closed fist is placed between the ischial tuberosities, and with a gentle rocking motion a very excellent idea whether the outlet is contracted or not can be obtained. This, combined with palpation of the pubic arch, gives the information we seek with great accuracy after very little practice.

In by far the majority of cases we find no disproportion between the baby and the pelvis, and our examinations simply make us doubly sure all is well. In a small proportion the disproportion is so marked that the treatment is very clear and a Cæsarian is done on an elected date. But there is the doubtful, the border-line case in which it is impossible honestly to say before labor begins what is the right treatment. It is in these doubtful cases that Cæsarian sections are being done so frequently; in many cases DeNormandie does not doubt but rightly, but in not a few cases unnecessarily. We can measure the pelvis, we can palpate the fetus, we can etherize the patient and try to estimate the disproportion, if it exists, but we cannot tell what labor will do to the fetal head unless we are willing to allow these patients, the border-line ones, to have the test of labor. By test of labor, DeNormandie does not mean a couple of hours of inefficient pains, but six or eight hours of good labor. The risk of doing a Cæsarian section after six hours of labor with no vaginal examinations is not great, and the good such a test does many times is worth the wait. DeNormandie does not wish to give the idea that he is advising against the Cæsarian. He is not, except in the unnecessary case. A Cæsarian is a simple procedure, but it is a major operation and carries a definite mortality in the hands of even the best men, and when anything goes wrong in the technique death usually follows. Operators are apt to say that the mortality rate in a Cæsarian *should* be about 1 to 2 per cent. That, in DeNormandie's opinion, is not the right way to put it. Each operator, when he advises a Cæsarian, should state, when asked, what the risk is, what his own mortality rate is, not what a good series of collected cases show. The craze that is at the present time sweeping over the country for Cæsarian section is entirely unwarranted, and DeNormandie is confident that soon we shall see the pendulum swing the other way. The advice that all primiparous breeches, poste-

rior positions, or what not be subjected to a Cæsarian section is not justifiable, and De Normandie is sure it is not good obstetrics. In another class of cases, in which the delivery the first time was difficult, many are here again advising Cæsarian in the future pregnancies. A case that came to DeNormandie's care last year shows what he means.

Some two or three years before this patient was delivered by a difficult forceps operation of a baby that lived, and did well. Before the operator left this patient he told the husband that if his wife were ever again pregnant she would have to have a Cæsarian. Last year she again went to this obstetrician, and he set a date for the Cæsarian, but the patient objected and said she would not have it unless it were absolutely necessary. To make a long controversy short, she left her first physician and came to DeNormandie. When he first saw her, two months before the expected date of the Cæsarian, she had a small baby with the head even at that time unusually low in the pelvis. As term approached there was no obvious disproportion present and DeNormandie determined to let her go into labor, reserving a Cæsarian if it proved necessary. She delivered herself two weeks after the appointed date for the Cæsarian after a short labor.

The first hard delivery made us watch her closely; but why subject a young girl to a Cæsarian and to repeated Cæsarians unless the indication is real, not fanciful? This case is not an unusual story and it is happening constantly, and unless we are willing to allow some of our patients to go into labor, Cæsarians of course will be the order of the day.

In primigravidæ where the head stays up high, the possibility of a Cæsarian must be kept in mind, but it must be remembered that a Cæsarian section late in labor carries a very high mortality and ought not to be done. Few obstetricians will take this added risk; many surgeons, however, will. Some patients get well after a stormy convalescence, but many die—and these are not reported.

THE AUTOGENOUS VACCINE IN THE TREATMENT OF PULMONARY TUBERCULOSIS.

Writing in *Colorado Medicine* for January, 1918, WESTCOTT states that the results of his personal experience with the autogenous vaccine in the treatment of certain forms of pulmonary tuberculosis have been very highly satisfactory. In selected cases, when the appropriate vaccine is secured, when the patient is living under approved conditions, with appropriate surroundings, good food and clean air, often pyrexia will be controlled, the expectoration and cough lessened; the appetite improves, and there will be a gain in the weight, and in the incipient or moderately advanced case the patient will stand a far better chance of securing the arrest or cure of his disease. In the far-advanced cases some control of the annoying symptoms may not infrequently result under treatment. In numerous cases in which the patient has been for months confined to his bed, with pyrexia, and the general malaise so frequently the accompaniment of this stage, he has, after a few weeks' treatment with the vaccine, been able to be up and around, to get out for brief rides and walks, and has gained a general relief from the annoying discomfort experienced but a short time previous.

Too much stress cannot be placed upon the care that must be exercised in the securing of the right organism from which to manufacture the vaccine; it must be secured from the section of the lungs that is being devastated; it must be free from the innocuous mouth bacteria; it must be artificially grown, under conditions as nearly as possible approximating those under which it is living in the lungs, if the resultant vaccine is to be potent and beneficial to the patient.

The dosage of vaccine prepared according to the Wright method, and standardized for 500,000,000 organisms, must be gauged according to the virulence of the organism, and the reaction produced if any by the initial dose. It is safe to start with a small dose, approximately 50,000,000, gradually increasing the dose from week to

week, advancing 50,000,000 every four to seven days.

In the chronic advanced types of disease prolonged treatment is essential to ultimate good results, and at the end of two months the patients should be taking about every five days 250,000,000 to 300,000,000; this is to be continued for six or eight months.

It is to be hoped that our laboratory workers will eventually evolve a more scientifically accurate method of determining the active and destructive organism in the mixed infection process. Experimental work along the line of complement fixation has been undertaken, and promises to be highly successful.

ARTIFICIAL PNEUMOTHORAX IN THE TREATMENT OF PULMONARY TUBERCULOSIS.

In the *Quarterly Journal of Medicine* for October, 1917, MORGAN reaches these conclusions:

1. Partial collapse of a tuberculous lung tends to give rest to any consolidated portion, and thereby to reduce autoinoculation.

2. The changes which take place as a result of the absorption of gas tend to reduce the amount of strain in the diseased parts when this strain is compared with that which existed before collapse. A single operation for collapse is therefore likely to be followed by good results.

3. A moderate degree of collapse does not materially interfere with respiration provided it allows sufficient normal tissue to functionate.

4. Both lungs can be treated at one and the same time. [This seems doubtful.—ED.]

5. In all cases of aspiration of fluid from the pleural cavity, the fluid removed should be replaced to some extent by gas. This is desirable, in the case of tuberculosis of the lung, in order to give rest to the diseased parts, and, generally, because it prevents the valve action of the lung and all that distress which would result from attempts to empty the cavity completely.

6. The apparatus and method usually employed for the operation are seriously defective in many respects, and necessitate the puncture of the lung and leakage of air from it.

7. The defects can be remedied by the use of a slightly more elaborate apparatus.

LOOSE SURGERY.

Under this heading the *Journal-Lancet* of February 15, 1918, reminds us that some months ago a celebrated surgeon wrote a very valuable article on unnecessary surgery, and he included in his paper many remarks which refer aptly to the loose methods of some surgeons. He admitted that there are many good, conscientious, reliable surgeons, and, furthermore, he stated that there are a number of men who are rather hasty in their judgments, and will operate on almost anything that will lie still, whether an operation is really necessary or not.

This situation has been before the profession for a long time, and any comment upon the attitude of certain surgeons seems to make no difference in their surgical methods. Undoubtedly there are many cases that look surgical, particularly to a surgeon, when not surgical; and these patients are often hurriedly, and without careful investigation, rushed into a hospital to be operated on, the case to be diagnosed after the operation. Such a course takes away the keenness and education of the surgical diagnostician. He should be the man that we may rely upon, first, to make a surgical diagnosis, and then to decide whether operative interference is necessary or not.

We are obliged again to refer to the more careful investigation of the individual, not only from a surgical but from a medical and a special view-point; and unless there is more coöperation and consultation work among the various representatives of the different departments of medicine, loose surgery is going to flourish. It is commonly understood that many a woman is operated on for pelvic troubles who has a

minor pathological lesion, and who perhaps never knew that she was carrying organs that were not thoroughly normal, at least not until the surgeon made his investigation and decided that some repair of the cervix or the perineum was necessary to cure her of a multiplicity of complaints. Not infrequently these women are built on a wrong nervous plan, and their nervous mechanism is so unstable that they magnify minor symptoms more than they should, and when their complaints are emphasized by the surgeon, who is too often impatient to operate, they become firmly convinced that their whole organism can be benefited by a surgical operation. This deluded state lasts for a period of time, and in the unstable the time is usually very short, a few weeks or perhaps a few months, when all of the old nervous complaints return. They perhaps are seeking relief, and they reappear in the surgeon's office, only to be told that something else has gone wrong, that adhesions have unexpectedly developed, and that it will be necessary for them to undergo a second operation. This operation is done, and the end-results are practically the same. Not infrequently these unstable neurotics are operated on five, six, or even ten times, with the result that the same symptoms appear in due course after each operation.

Women who have grown old before their time are not infrequently subjected to needless and usually harmful operations, whereas an investigation of their arterial state, or their evolutional state, would clear up the situation and eliminate the necessity for operative measures. Then, too, as has been said before, surgeons are sometimes very busy, and make a rapid examination and follow it up with a rapid and not well-thought-out conclusion, only to find, to their chagrin, it is hoped, that the patient has something entirely different the matter with her. These cases are not uncommon, as every surgeon will admit. Even the best surgeons assert that it is often very difficult to make a completely satisfactory diagnosis. Women are operated on for fibroids when they have ovarian tumors, and are sometimes operated on for ovarian tumors when they are pregnant. The diagnosis is made only after the operation.

This is not said to censure the surgeon, but to suggest that in these times of stress and anxiety more consideration be given the individual under investigation and inspection, and that more historical data be gathered before a final conclusion is reached, and thus save many people from needless operations, which are frequently followed by needless and unnecessary symptoms.

THE TREATMENT OF HAY-FEVER AND ASTHMA BY POLLEN EXTRACTS AND BACTERIAL VACCINES.

In the course of an article on this topic in the *New York Medical Journal* of June 1, 1918, SCHEPPEGRELL states that in the prevention of hay-fever by means of pollen extract the treatment should commence four or six weeks before the usual appearance of the hay-fever. The injections should be made two or three times a week, in doses gradually increasing from five to fifty units. Although doses increased to a high number of units (1000) have been advocated, and several of the pollen extracts on the market are especially prepared for this, no apparent advantage was observed. On the contrary, some of the cases, in which there was no perceptible improvement, were amongst those in which the prophylactic doses had been increased to 700 to a 1000 units for each injection.

Several days before the patient's hay-fever season is due, the prophylactic doses should be rapidly decreased, as the patient will soon absorb the pollen from the atmosphere. In a case, for instance, in which the patient is receiving fifty units of the pollen protein, this should be reduced to ten units.

The treatment of the cases of his series, during the active stage of the hay-fever, was limited to the hypodermic injection of pollen extracts and bacterial vaccines. The extract of the pollen was selected to which

the patient was found to be sensitive, and to which he was exposed as indicated by the pollenometric records. The pollen responsible for most of the early hay-fever cases (April to July) was found to be from the grasses (Graminaceæ), which also include the cultivated varieties such as rye, wheat, oats, and corn. The fall hay-fever (August, September, and October) was found to be principally due (ninety-five per cent) to the ragweeds (Ambrosiaceæ). The large size of the corn pollen (eighty microns) limits its potential area to a short distance from the plant.

In the spring hay-fever cases the extract of the grass pollen was used, and in the fall cases that of the ragweeds. In cases in which the patient suffered from both forms of hay-fever (spring and fall) the grass pollen was injected at first, and the ragweed extract during the fall season. Combined extracts should not be used in these cases, either for prophylactic or curative purposes. The grass pollens predominate in the early part of the season and the ragweed in the latter, and the pollen extracts should therefore be adapted to each season. The patient, moreover, is rarely equally sensitive to both pollens, so that a combined extract, in which equal parts of each pollen is used, is not indicated.

While Scheppegrell's former experience has shown that pollen therapy is useful in the treatment of hay-fever, he found that there were many cases in which this form of treatment alone did not give satisfactory results. With the majority of patients, therefore, this was combined with the vaccine therapy. Selecting the cured (seasonal) cases Scheppegrell found that in forty-one per cent pollen extract only was used, in fifty-four per cent both pollen and vaccine therapy, and in five per cent bacterial vaccines only. The selection of the form of treatment varies according to the patient's condition, which is influenced by the number of atmospheric pollens which he is inhaling. This depends upon the season and the velocity of the prevailing wind. During the early part of the season, when the grasses and weeds are beginning to pollinate, and toward its end when this is nearly completed, the number of pollens in the air is relatively small and the patient's attacks are light. During the middle of the season, however, the number is greatly increased with corresponding suffering of the patient.

The principal cause of the increase in the hay-fever paroxysms, however, is due to atmospheric disturbances during the active pollinating season. During a light wind, one to six miles per hour, pollen is carried only short distances, while in high winds, fifteen to twenty-five miles per hour, pollen in large quantities is carried to great distances (five miles or more), so that the number may reach 300 to 400 pollens per square yard of air. During the prevalence of such winds, all hay-fever patients in the vicinity who are sensitive to these pollens suffer greatly. If the patient applies for treatment during a severe period, the pollen extracts are usually ineffective and a vaccine should be used, these being injected at intervals of one or two days until the severity of the attack subsides. The pollen extract is then used, the vaccine injections being resumed if a severe paroxysm develops. Scheppegrell's reason for using the vaccine during the severe paroxysms is that at this time the patient is suffering not only from the effects of the pollen but also from the great increase in the pathogenic microörganisms resulting from the lowered resistance of the respiratory membranes. The use of vaccine therapy at this stage is therefore logical, and has given him satisfactory results. In a few cases (five per cent of his series) the treatment of the successful ones was limited to vaccine therapy only. The question of autogenous and stock vaccines has been carefully considered in this series. The autogenous vaccines are preferable provided they can be obtained of the proper standard and purity. When there is any doubt regarding this, the stock vaccines of unquestionable reliability should be given the preference.

The "catarrhal" stock vaccines are the

best adapted for hay-fever cases, although their percentage of staphylococci and streptococci is relatively too high. For this reason Scheppegrell uses a vaccine based on the results of his bacterial finding in a large number of hay-fever cases, and which contains per Cc. as follows:

350 million killed B. Friedlander.
450 million killed M. catarrhalis.
30 million killed pneumococcus.
35 million killed streptococcus.
50 million killed staphylococcus aureus.
40 million killed staphylococcus albus.

The initial dose of this is 0.50 Cc., which is usually followed one to three days later by a full dose of 1 Cc.

The tendency of hay-fever to develop asthma is well known. It is usually a later complication, although sometimes it is the first and, occasionally, the only symptom of this disease. In the cases of this series, forty per cent suffered from asthma during some portion of the season. Although this is a higher ratio than has been heretofore recognized in hay-fever, the probability is that the proportion is still higher. There are many cases in which the nasal symptoms of hay-fever are so mild and of such short duration that the patient recognizes only the asthma from which he is suffering. In addition to this, there are also cases of asthma, due to pollen sensitization, in which the nasal symptoms are apparently entirely absent and therefore its relation to hay-fever unrecognized. In view of this, all cases of asthma, especially those occurring during the usual hay-fever season, should be tested with the extracts of the atmospheric pollens to which the patient is exposed. Scheppegrell's experience has shown that the number of asthmatic patients giving positive reactions to the pollens, especially of the grasses and ragweed, is quite high. This diagnostic test is therefore important, especially in view of his experience that these cases not only responded favorably to the combined hay-fever therapy, but that the number of seasonal cures and improvements equals those of the uncomplicated forms of hay-fever.

From an analysis of the result in these patients, Scheppegrell found that there were seasonal cures in forty-five per cent of the cases and marked improvement in forty-two, or satisfactory results in eighty-seven per cent of the total number.

In six per cent of these cases there was little or no perceptible improvement, and seven per cent discontinued the treatment before the results could be noted. In no case was there any aggravation of the hay-fever symptoms from the treatment, or other ill effect.

A so-called "seasonal cure" in these cases indicates that there were no more hay-fever symptoms for the remainder of the season. Before the opening of the following hay-fever season these cases are again given the diagnostic test. If this is positive the treatment is repeated. In cases of recent origin one course of treatment is usually sufficient, but in cases of longer standing two or three courses are required.

In some of the cases treated during previous seasons there was no apparent improvement, but the patients had relief from the hay-fever symptoms the following season.

PNEUMONIA PHYLACOGEN IN THE TREATMENT OF PNEUMONIA.

RICHMOND in the *Medical Fortnightly* of May 15, 1918, reports his experience with this plan of treatment, and these are his conclusions:

1. In the majority of the cases treated the disease did not run its usual length of time.

2. There was a markedly noted decrease in complications and sequelæ.

3. There is no other remedy that Richmond knows of that has such a marked influence in controlling the fever in this grave condition.

4. The majority of cases treated terminated by lysis.

5. Pneumonia phylacogen is by far the most valuable remedial agent in our armamentarium against this wide-spread, serious malady.

THE VALUE OF TURPENTINE IN HEMORRHAGE.

ALLAN in the *Prescriber* for February, 1918, well says that enthusiasm for testing new drugs often leads to neglect of older remedies, and this sometimes results in useful therapeutic agents falling into desuetude. The value of turpentine applied locally for hemorrhage is well known, yet it is not so frequently employed as it might be. This is rather surprising, because turpentine is generally available, or at any rate is easily obtainable. Allan has many times demonstrated its local utility in hemorrhage in practice, and he can best illustrate this point by quoting a few cases.

A workman had an oblique portion of the tip of one of his fingers removed by the blade of a cutting machine. There was considerable hemorrhage, but no actual bleeding point which could be ligatured was to be seen. There was simply capillary oozing, which gauze soaked in hydrogen peroxide, etc., failed to check. When Allan saw the case he suggested the application of gauze wrung out of turpentine, and this was successful in stopping the bleeding. In another case a soldier had several teeth extracted, and the after-bleeding, especially from one tooth socket, seemed uncontrollable. The bleeding was so severe that the man was admitted to hospital instead of being returned to his depot. The customary styptics were applied locally without success, but when turpentine was tried the hemorrhage ceased. Another youth had a submucous resection of the septum nasi done, and contrary to the usual experience persistent capillary oozing set in, which was not checked until the nasal cavities had been packed with gauze soaked in turpentine. In a little boy, who was afterwards discovered to be a hemophilic subject, an abscess was opened in the thigh, and from the wall of the abscess cavity hemorrhage occurred which proved difficult to check. The best local application in this case also was gauze packing soaked in turpentine. Other conditions in which turpentine locally has been of service are post-circumcision hemorrhage and bleeding after tonsil and adenoid operations.

There is one practical point in using turpentine for the purpose indicated, and that is, the gauze should not be applied saturated with superfluous fluid. The gauze should be well soaked in the turpentine, but prior to application to the affected part it should be thoroughly squeezed and wrung almost dry, otherwise results will be disappointing. Allan has employed turpentine with success when other drugs have failed, and considers this homely remedy deserves fuller recognition in the routine treatment of capillary hemorrhage.

THE DISPOSITION OF PATIENTS AND CANDIDATES FOR ENLISTMENT WHO PRESENT SYMPTOMS AND SIGNS OF HEART DISEASE.

In the *Military Surgeon* for February, 1918, SWAN points out that one of the first considerations in the treatment of these cases is the removal of foci of infection—the extraction of carious teeth, the removal of septic tonsils, cleansing of the mouth by antiseptic washes, and the removal of a chronically inflamed appendix. Swan suggests the following conclusions for the guidance of recruiting officers and ward surgeons: (1) A candidate for enlistment who presents definite evidence of mitral stenosis, aortic regurgitation, aneurism, or hypertrophy of the heart should be rejected. (2) A candidate who presents an apex systolic murmur, transmitted into the axilla and heard at the angle of the scapula, accompanied by definite evidence of cardiac hypertrophy and subjective symptoms, should be rejected. (3) A candidate who presents an apex or a basal systolic murmur of irregular transmission, not accompanied with cardiac hypertrophy, and unattended, except occasionally, with subjective symptoms, should be accepted. It is altogether likely that such a candidate, under regular out-of-door life with systematic muscular exercise, would prove satisfactory material for the development

of a good soldier. (4) A candidate who presents an extra-systolic arrhythmia or a respiratory arrhythmia should be accepted, provided there is no evidence of organic heart disease. (5) A candidate who presents a pulse irregularis perpetuus (auricular fibrillation) should be rejected. (6) Cases of functional cardiac disease which have, in the past, been termed irritable heart of soldiers, etc., should not be treated as cardiac cases. They should not receive digitalis. They should not be kept in bed. They should be employed at tasks which require a gradually increasing expenditure of muscular effort. Calisthenics should form a part of their treatment. (7) Candidates for enlistment who give a history of syphilis and recurring attacks of rheumatic fever should be rejected.

FURTHER OBSERVATIONS ON THE CLINICAL ACTION OF VERATRUM.

In the *Journal of Pharmacology and Experimental Therapeutics* for February, 1918, COLLINS and HANZLIK contribute these conclusions:

1. A slowing of the pulse and fall of blood-pressure occur with single therapeutic doses of 15 to 20 minims of the tincture of veratrum album, and these occur independently of such symptoms as nausea, vomiting, etc. ("toxicity").

2. Large and repeated doses (25 to 75 minims) produced a slowing of the pulse together with a fall in both systolic and diastolic blood-pressure in practically all individuals studied by the writers. The fall of blood-pressure and diminution in pulse-rate are roughly proportional to the dose. All the desirable circulatory effects produced by tincture of veratrum album may be secured with doses ranging from 45 to 55 minims, administered at the rate of about 10 to 15 minims every one-half to one hour, and without symptoms of "toxicity."

3. Repeated large doses administered within short intervals are apt to give rise to symptoms of "toxicity." These effects are generally absent with small doses given at long intervals.

4. Two normal individuals responded to tincture of veratrum album with a fall of systolic and diastolic blood-pressure and slowing of pulse-rate in the usual way.

5. Effects in various circulatory disorders were observed about as follows: most marked in hypertonus; less marked, inconstant, or no effect at all in heart block (two cases); paroxysmal tachycardia, myocarditis with renal vascular disease, aortic insufficiency (one case each).

6. The usual effects of slowing of the pulse and fall of both systolic and diastolic blood-pressure were observed in a patient with eclampsia. A number of miscellaneous clinical conditions also responded in the usual way.

7. There were no demonstrable effects on the electrocardiogram.

8. No noteworthy effects with both small and large doses of veratrum album were observed on the respiration.

9. Using compound tincture of gentian (U. S. P.) under the same conditions as tincture of veratrum album in the same and other individuals, no noteworthy effects on the circulation were demonstrable. The effects of veratrum are due, therefore, to the drug *per se*.

VERONAL.

The *British Medical Journal* of February 9, 1918, calls attention to the fact that two cases in which the effects of veronal came under consideration have been heard recently in courts of law. In one the inquiry was as to the cause of the sudden death of General Sir Beauchamp Duff, who, it was stated at the inquest, had suffered from insomnia, which had been aggravated by anxiety due to the references to him in the report of the Mesopotamia Commission. It appeared that he had recently been in the habit of purchasing a bottle containing twenty-five tablets of veronal about once a month. The jury returned a verdict that death resulted from narcotic poison, self-

administered for the purpose of procuring sleep, and was due to misadventure In the other case an insurance company, in resisting a claim under a life policy, asserted that the insured person was in the habit of taking veronal and that this should have been disclosed when the policy was effected.

The points of chief medical interest in these two cases are the dose and the matter of the establishment of a veronal habit. Dr. W. H. Willcox, in a paper he contributed to the *British Medical Journal* in September, 1913 (p. 663), gave 15 grains as the smallest dose which had proved fatal. A medical witness at the inquest said that he had known a case in which 5 grains had produced a fatal result. This statement, we gather, applied to a particular case, probably best included among those mentioned by Dr. Willcox in which the veronal may be regarded as a contributory cause of the death of a patient in a bad state of health rather than the actual cause. The same witness stated that veronal produced a certain amount of tolerance, but not so much as morphine or other drugs. In the insurance case Sir James Mackenzie, in the course of his evidence, said that there was no such thing as a veronal habit; people did not crave for it as they did for morphine or bromides, but took it only to meet the particular necessity. After recording this view, which, however, is not accepted by all medical authorities, we come to the point that a person may become addicted to the use of veronal, and that in certain conditions of health a dose of 15 grains—that is to say, three of the tablets ordinarily sold—may produce a fatal result. By an Order in Council made some time ago, diethyl barbituric acid and other alkyl, aryl, or metallic derivatives of barbituric acid, whether described as veronal, proponal, medinal, or by any other trade name, and all poisonous urethanes and ureides, were included in Part I of the schedule of poisons under the Pharmacy Act. The effect of the order is that veronal and the other allied substances may now be sold only to persons who are either known to the chemist or are introduced by some one known to him, and that on the occasion of each sale the vender must at the time of sale and before delivery make the prescribed entry of the sale in his poison book, to which the signature of the purchaser, and of the person, if any, who introduces him, must be affixed.

The Home Office has issued an official notice to the public in the following terms: "There have been many cases of veronal poisoning in this country, and it is desirable that it should be known that the drug cannot safely be used except upon the advice of a medical practitioner on each occasion. Many persons are specially susceptible to its action, and fatal poisoning may occur even from small doses of the drug, especially if repeated. The danger is still greater when doses are progressively increased. It is most important, therefore, that veronal and its derivatives and allied substances should only be taken with the knowledge and consent of a medical practitioner, and on his written prescription, and it is advisable that the dispensing of such prescriptions should not be repeated without the written sanction of the medical man."

TREATMENT OF PAINFUL DYSPHAGIA IN TUBERCULOUS LARYNGITIS.

In the *New York Medical Journal* of February 23, 1918, LUKENS tells us that the purpose of his paper is mainly to urge the use of nerve blocking of the internal branch of the superior laryngeal nerve for painful dysphagia, and to report results of its use in nineteen cases in the Department for Diseases of the Chest of the Jefferson Hospital. Hoffman originated the method of injecting the internal laryngeal nerve for dysphagia and reported two cases in 1908. Levinstein two years later mentioned six cases. Lewy was the first in this country, and he recorded two cases. Fetterolf in 1912 reported sixteen additional cases, seven of which had complete relief after one injection; three had complete relief after two or more injections; four had partial relief; two had no relief. Various

writers have since observed cases which showed excellent results from injection of the nerve, but in spite of this a great many physicians either do not know of the procedure or do not use it, feeling that the patient has but a short time to live and that nothing but morphine or cocaine would give relief for the suffering.

As in other procedures, there are a few failures. These failures are due to faulty technique, to anomalous position of the nerve, or to the fact that the tuberculous process causing the dysphagia is external to the larynx.

The method which Lukens uses is that of Hoffman, except that he does not go in at right angles to the nerve, but a little forward, directing the needle inward and backward. Thorough asepsis should be used throughout as regards the operator's hands, instruments, and skin of neck. The instruments and solution required are a Luer's or Record syringe, tincture of iodine, and the fluid for injection, which is sixty-five to eighty-five per cent alcohol. A hypodermic syringe may be used, with a one-and-one-half-inch, twenty-four-gauge needle with a sharp point. Lukens uses a solution consisting of novocaine, two grains; chloroform, ten minims; alcohol, six drachms; water, two drachms—essentially a sixty-five-per-cent solution of alcohol.

The patient should be either lying supine with the head, neck, and shoulders raised on a pillow and the head turned to one side, or sitting upright in a chair with a comfortable back. Lukens prefers the sitting posture with the head in a natural position and the neck not rigid, which seems to be most convenient for the patient and the operator alike. The greater cornu of the hyoid bone and the superior cornu of the thyroid cartilage are located with the index-finger of the left hand and the loaded syringe is held in the right hand. The needle is then thrust through the skin about one inch anterior to the directing finger and a quarter-inch above the margin of the thyroid cartilage and pushed backward and inward, the point being raised from time to time to locate its position by the directing finger-tip of the left hand. The patient gives the signal of pain in the ear by raising his hand. The nerve has been touched, and a drop or two of solution is injected, moving the needle around so as to surround the nerve thoroughly. Usually the pain in the ear is intensified by the discharge of the fluid into the tissues about the nerve, but passes off in a few seconds. One or both sides may be injected at one sitting. Lukens has injected both sides eighteen times in thirty-six injections, and has noticed no untoward effects that he could ascribe to the bilateral injection. One patient complained of a "slight constriction" in the throat, but, on the other hand, another patient complained of the same thing who had only the left side injected. These were the only two patients who had any untoward effects, which passed off in a few days, and in none has paralysis or swelling developed.

The side to be injected depends upon the site of the greater pain in swallowing. the site of the lesion, and the side on which the nerve is the more tender. If injection of one side does not wholly relieve the pain the other side is injected at the same sitting. If the pain is not then relieved the nerves are injected at intervals of three to five days. Only one case showed no benefit after one or more injections, and in this case the lesion of the larynx was very slight. It is possible that the dysphagia was due to an extralaryngeal process. Lukens always has the patient try to drink water before and immediately after the injection and note the difference. In the earlier operations Lukens has had the patient eat a crust of bread in addition to drinking the water, but found that it was unnecessary. Second injections were often made at the request of the patient. None of them objected to subsequent injections. One patient, when asked if the relief of the dysphagia was worth the pain of injection, replied, "It hurt like hell, but the relief was like heaven." Lukens wants to say that

the technique practiced in this particular case was the one which he was originally taught, namely, the use of a blunt needle. He now uses a needle with a sharp point.

No contraindications to the injection are known.

A summary of the results of the nineteen cases is as follows: The age ranged from twenty-two to forty-eight years. All were males with the exception of two. Tubercle bacilli were present in the sputum in all cases except one. All except five were far-advanced pulmonary cases; four were moderately advanced; one had tuberculous epididymitis and but slight pulmonary changes. Twelve had involvement of the epiglottis, nine of which were of the turban type, and all presented ulcerations. Thirty-nine injections were made, twenty-one of which were bilateral; nine were made on the right side and nine on the left side, making eighteen unilateral injections; six had absolute cessation of pain within a few minutes after the first injection and one within twenty-four hours. One had partial relief after the first, and absolute cessation after the second injection. One had no relief after the first, and absolute cessation after the second injection. Nine patients had only very slight discomfort after one or more injections. Only one patient had no relief. This patient was dying at the time of the injection. The relief was marked in all cases. The shortest period of relief from one injection was three days and the longest forty-two days. The shortest total number of days of relief from one or more injections was six days and the longest 105 days. Eight patients had but one injection; four had two injections; four had three injections; three had four injections. Two patients left the hospital before the return of pain. Five died in from six to twenty-four days after injection without return of pain. By relief of pain Lukens means of any discomfort whatever.

In all cases of painful dysphagia the internal laryngeal nerve should be blocked. There are no contraindications to nerve blocking, and this procedure aids the dietetic treatment by removing or lessening dysphagia sufficiently to allow the patient to eat necessary food.

More rest is obtained due to cessation of pain from the throat, and any number of injections may be made and the patient kept in constant comfort by injecting as soon as the pain recurs.

Histological examinations of injected nerves showed that the results modified the nerve trunk very little; there was usually fibrosis, and in some cases numerous spaces were observed within the bundles of the nerve fibers.

The writer wishes to urge the wider use of this method of treating painful dysphagia in tuberculous ulceration of the larynx, as it is a procedure which can be easily learned and practiced by the average practitioner.

HODGKIN'S DISEASE AND ITS TREATMENT.

BOARDMAN in the *California State Journal of Medicine* for March, 1918, reports cases of this disease treated by *x*-rays. A review of these cases emphasizes the following points:

1. Wide dissemination had occurred in the majority of the cases before a correct diagnosis was made, or proper treatment instituted. In some this delay was chargeable to the patient, but in others it demonstrates a lack of diligence or knowledge on the part of the attending physician.

2. The frequency of early mediastinal involvement was striking.

3. A diagnosis based upon the blood findings was not possible in any of these cases. In the majority of cases the number of transitional and large mononuclear cells combined did not exceed either relatively or absolutely the normal limits of transitionals alone. We, therefore, cannot make a diagnosis of Hodgkin's disease without the histological examination of an excised gland.

4. In no case was there any exacerbation

of the disease traceable to the removal of a test gland.

5. Vaccines were of no avail in one case. Benzol was tried in a second case, but without effect.

6. Radical removal of involved glands was followed by local recurrence when insufficient Roentgenotherapy was given over the operative field.

7. Removal of foci of infection produced no evident alteration in the course of the disease.

8. In all cases so far treated the superficial glands have practically disappeared under Roentgenotherapy and have caused no further concern during the course of the disease. There has, therefore, been no apparent reason or justification for radical removal of such gland groups.

9. Mediastinal and abdominal glands are not subject to surgical removal.

10. With proper treatment it is possible to cause absorption of these deep glands. How long such enlargement can be kept under control by deep Roentgenotherapy has still to be determined, as none of these cases have been satisfactorily treated throughout the entire course of the disease.

11. The close parallelism between certain cases of lymphosarcoma and Hodgkin's disease, both in clinical manifestations, response to treatment, and histological picture, is very striking and suggestive.

In conclusion Boardman says that:

1st. The etiology of Hodgkin's disease is still unsettled.

2d. The diphtheroid organism seems likely to prove a mere saprophyte.

3d. There is good reason to consider Hodgkin's disease a neoplasm closely related to lymphosarcomata and endotheliomata.

4th. Efforts must be made for earlier diagnosis.

5th. Diagnosis must as yet rest upon the examination of an excised gland and not upon the examination of a blood smear.

6th. Treatment of early localized cases should consist of the radical removal of the involved glands and the removal of foci of irritation, together with thorough and persistent Roentgen treatment of the operative field and of all neighboring lymphatic areas, especially the mediastinum. Cure seems possible in these cases.

7th. In the more advanced cases with wide dissemination, the only treatment is Roentgenotherapy. If this is given thoroughly and persistently, remarkable temporary results may be obtained, and it is remotely possible that cure might be achieved.

8th. In the advanced cases Boardman has seen no indication for surgery other than the removal of foci of irritation.

9th. Vaccine therapy has been a failure and there is little reason to expect more from the immune serum.

10th. The technical details of Roentgenotherapy have been omitted from this communication.

THE TREATMENT OF TRACHOMA.

In the *Medical Review of Reviews* for March, 1918, BRAV emphasizes the self-evident point that in treating trachoma the therapeutic agent must be applied with a distinct object in view. Palliative measures are not only useless, but are practically harmful. It is true that palliative measures often give temporary relief, but it does not shorten the course of the disease; it does not prevent corneal complications; it does not prevent the formation of pannus; it does not prevent changes in the contour of the lid, and its subsequent results, trichiasis and entropion; it does not prevent recurrent inflammations, and if corneal complications are already present it has very little effect in preventing a marked reduction in the visual acuity of the individual. Radical measures alone can be and should be relied upon in bringing about a cure. Our aim in the treatment of trachoma must be:

(1) To shorten the course of the disease.

(2) To alleviate the symptoms.

(3) To prevent corneal complications and conserve vision.

(4) To prevent recurrences and relapses.

(5) To prevent trichiasis and entropion.

Only surgical measures can bring about this desired result. Of course not all patients are willing to submit to surgical measures, especially in the early stages of the disease, and it becomes necessary to employ the medicinal agent. Copper sulphate in various forms has been used in the past. Solutions of various strengths were used. Ointments incorporating some copper were freely prescribed, and the blue pencil or copper sulphate stick was the most reliable agent in the hands of the physician. Brav has discarded its use altogether. It is very painful, it gives rise to corneal ulcerations, and he fully believes that in the long run it does more harm than good. Of course prolonged application of copper for years will eventually destroy the granulation tissue, but this can be accomplished with a much milder drug and one that will not produce repeated ulceration of the cornea.

Silver nitrate, Brav asserts, is the only medical agent that is useful in the treatment of trachoma, and if long continued will eventually bring about a partial cure and in mild cases a complete cure. Silver nitrate does not injure the corneal epithelium, and is therefore to be preferred to copper sulphate.

A 25-per-cent solution of boroglyceride is a valuable agent, and after its application patients feel greatly relieved.

Brav has in his earlier days tried all methods of treatment, medicinal, mechanical, and after fifteen years of experience with a large number of trachoma cases he has come to the conclusion that the only rational treatment is the surgical treatment. For the last five years he tried to persuade every trachomatous patient to submit to a surgical cure, and he has never regretted it, as it was always gratifying to both Brav and the patient.

There are two surgical procedures that can be employed in trachoma—grattage and the removal of the tarsal cartilage. Both these operations have definite indications and both have a curative value. In the early stages of the disease, when no corneal complications exist and when the lids are not very thick, grattage or a thorough scarification of the lid properly performed will cure the case. The operation is free from danger, and in the vast majority of cases the result will be a permanent cure. When, however, the cornea has been affected, when the lids are thick, when the hypertrophy of the conjunctiva is very marked, a simple grattage will not cure the case, and it is best to resect the tarsal cartilage. The operation is very simple, easily performed, and the after-treatment is very easy. It must, however, be remembered that in the complicated cases when both lower and upper lid are involved it is necessary to scarify the lower lid, while the tarsus from the upper lid is removed. Both these operations are described in the text-books and do not require any description here.

This paper is written with the distinct object of urging the operative treatment for trachoma. It shortens the course of the disease, it cures the disease, it prevents recurrences, it prevents corneal complications, and in many cases of pannus where the visual acuity has been reduced to a minimum it is still possible to restore sufficient vision to enable the patient to follow a useful occupation. Brav states he has saved many trachomatous patients who could hardly see to go about and some that were practically blind from pannus, and enabled them to follow some occupation by the combined effort of grattage and resection of the tarsus. Wherever surgical treatment is possible the medical treatment is a waste of time and expense to the patient.

URINARY INFECTIONS OF PREGNANCY AND THE PUERPERIUM.

To the *American Journal of the Medical Sciences* for March, 1918, SMITH contributes a paper on this topic. He thinks that one is justified, probably, in drawing the following conclusions:

1. Urinary infection as a complication of obstetrical practice is probably not rare. Just how frequent it is cannot be accurately

stated. Smith has seen four cases during a period of time in which there had occurred only one case of eclampsia.

2. Pregnant women are predisposed to urinary infection by reason of interference with drainage and by the further fact that conditions are ideal for transmission of infection.

3. The colon bacillus gaining entrance from the bowel is the usual infecting agent.

4. When a pregnant or puerperal woman has any febrile illness, whatever may be the type of fever, or whatever the associated symptoms, a catheterized specimen of urine should be obtained at the first visit. If this urine be cloudy, acid, and albuminous, one should immediately suspect infection of the higher urinary tract and should make a microscopic examination before any other diagnosis is accepted.

5. Clinical signs and symptoms may be most confusing without, or even with, laboratory aid, and especially are we apt to miscall the case appendicitis, because the pain, tenderness, and rigidity are most often right-sided. In such cases the right kidney region ought always to be examined for tenderness, etc.

6. Treatment which has been efficacious and at the same time practicable is: (1) Rapid alkalinization of the urine with potassium citrate. This has been more certain, by far, than hexamethylenamin. Certainly, potassium citrate and hexamethylenamin should not be given at the same time, for one tends to render the urine alkaline and the other depends upon a high degree of acidity for any possible value. (2) In the meantime we can usually get a supply of the "sensitized" vaccine, of the colon bacillus, because it can be sooner given than (3) an autogenous vaccine, which should be prepared as soon as possible. Under such treatment all of Smith's cases so far have been controlled until delivery has cleared up the picture. But should the symptoms persist stormily in spite of us, then the patient should be referred for irrigation of the kidney pelvis, or possibly even nephrotomy or nephrectomy.

7. Mere persistence of pyuria, on the other hand, we might say is to be expected, and need occasion no undue alarm, if the patient be symptomless, and especially if there be no fever at all and no leucocytosis. Such patients usually go to full term, with normal labor and puerperium, immune apparently from risks of their infection.

SHOULD CHRONIC PEPTIC ULCER BE TREATED MEDICALLY OR SURGICALLY?

Writing in the *American Medicine* for February, 1918, FRIEDMAN states that the arguments advanced by the advocates of medical measures in such instances may be briefly stated as follows:

1. A large proportion of cases are reported cured by thorough treatment. These cases were treated for ulcer by dietary and medicinal means or by feeding through a duodenal tube, and subsequently do not show symptoms or signs of ulcer for months or for years. Since the recurrence of symptoms is not evident for shorter or longer periods of time, the supporters in favor of the medical procedure declared their patients permanently cured and therefore out of danger of the well-known complication which may occur in the course of a chronic peptic ulcer.

2. Many ulcers heal spontaneously in man. Just what particular factors interfere with the healing of so many uncomplicated ulcers are, as yet, unknown, but that healing does actually take place may be verified by the scars noticed in the stomachs examined at autopsies. Deep scars in the walls of the stomach or duodenum may be also seen at operations, or occasionally a scar from a healed ulcer, and a recent soft ulcer may be found in the stomach at the same time. When such scars are found their presence suggests that Nature directs the healing process of ulcers. Therefore it is claimed that since ulcers tend to heal themselves, this tendency to cure is enhanced and more successful if assisted by medical measures.

3. Numerous patients afflicted with chronic peptic ulcer show a disturbance in

the equilibrium of the vegetative nervous system. They present vegetative stigmata, either of the vagotonic or sympatheticotonic groups. Such patients belonging to either division are rarely benefited by operative intervention, because the tendency to reformation or the cause is not removed.

4. Many cases fail under surgical treatment. The symptoms persist even after the best operation, and repetition of surgical interference is necessary. Even after the second operation there is no improvement in the condition of the patient on account of the occasional formation of new ulcers. Pain, even in patients not belonging to the neurotic group, for which the surgical measures were especially instituted, is frequently not relieved, and is, perhaps, in a large proportion of cases particularly responsible for the repeated operation. In other cases at the second laparotomy a jejunal ulcer may be detected. In some postoperative adhesions or stenosis of the gastroenterostomic opening necessitated repetition of the operation. In others on reopening the abdomen none of the mentioned conditions are found, and the surgeon, not discovering any fault with his original technique, admits that he cannot explain the persistence of symptoms. Occasionally patients submit to a third operation on account of their suffering for years.

5. Furthermore, the advocates of medical treatment point out the dangers of operation and declare surgical interference to be extremely grave, especially in certain instances. They claim pneumonia occasionally develops after operation and that a latent tuberculosis may become active as a consequence of the anesthetic.

6. Finally, those who claim the superiority of medical over surgical methods add that since violence has been done to the body by operation, nervous symptoms existing before operation become more pronounced.

For the six reasons mentioned the advocates of medical procedures insist that the simple and uncomplicated ulcer in the great majority of cases is a medical disease. However, they admit that there are some selective cases of chronic ulcer which must be treated surgically, and they refer such cases, under certain circumstances, to the surgeon, not because they are convinced of the absolute success of surgery, but because they find that medical treatment has its limitations.

On the other hand those who advocate surgical interefernce in uncomplicated peptic ulcer present the following arguments:

1. Statistics of medical cures are of no great value and are unreliable. Patients suffering from chronic ulcer change their physicians often and consequently are lost sight of. In many of the statistics compiled they are usually counted as cures because they do not return. Again the diagnosis is often uncertain. There might have been hyperchlorhydria, and acid dyspepsia and so forth.

2. The best medical cure is often only temporary. It is admitted that medical measures can bring about relief.

3. The ulcer occasionally runs a latent course and the quiescence of symptoms does not signify a cure.

4. Even after a long period of inactivity of symptoms, the ulcer being apparently cured, perforation or hemorrhage from stomach or duodenum may occur suddenly as an acute complication.

5. In cases of simple ulcer the pain may be so severe that it cannot be even temporarily relieved by dietary and medicinal treatment.

6. Better results are obtained by excision of the ulcer wherever this is available or by gastroenterostomy with pyloric exclusion. These means remove the complications of ulcer such as hemorrhage and perforation.

7. Finally, surgical therapy does remove the danger of malignant degeneration. There is a possibility of cancer developing on the base of an old ulcer, and this it is claimed must be taken into consideration in favor of surgical intervention.

The surgeons, too, find that their treat-

ment has its limitations and that their inability to cure is due mainly to the fact that in some patients the stomach cannot adjust itself to the new conditions created by the operation, and in other cases nervous symptoms are so predominant that the patient does not remain well even after the most successful of the various surgical procedures. In some instances their symptoms actually become aggravated.

It seems to Friedman that there is no criterion by which to judge medical cures. It surely is curious that some physicians after medical treatment has been instituted for weeks or months with good results are apt to claim that their patients are cured from ulcer. One hears also of the rapid disappearance of symptoms brought about by feeding the patient by means of a duodenal tube. All of us have seen that the severest pain or persistent vomiting ceased in patients by either of the methods, even those who had been told to undergo an operation immediately; then we have also seen them return after some years with the same symptoms and occasionally with complications, perforations, or intestinal hemorrhages.

Even patients who according to Bettmann's dictum have not only been treated, but have been "well treated," show a recurrence of ulcer after longer periods.

PRIMARY TUBERCULOSIS OF THE FAUCIAL TONSILS IN CHILDREN.

In the *Journal of Laryngology, Rhinology, and Otology* for February, 1918, MITCHELL writes on this topic. The conclusions which he thinks are warranted by the present investigation upon primary tuberculosis of the faucial tonsils may be stated as follows:

1. Tuberculosis of the upper deep cervical glands develops from a primary focus in the faucial tonsils much more frequently than is generally supposed.

2. Primary tuberculosis of the faucial tonsils can be recognized only by the aid of the microscope and by inoculation experiments. The lesions are found in certain localities, namely, immediately under the surface epithelium and near the mouth of the lacunæ, in relation to the deeper portions of crypts, or deep in the tonsil close to the capsule. The first-mentioned site supplied the greatest number of examples.

3. Hypertrophied faucial tonsils are the seat of primary tuberculosis, though rarely as compared with tonsils from cases of tuberculous cervical adenitis.

4. The experimental results indicate that in Scotland, at any rate, primary tuberculosis of the faucial tonsils in children must be attributed to the drinking of milk from tuberculous cows, rather than to the inhalation of human tubercle bacilli conveyed by dried sputum or the moist spray from the coughing of a consumptive patient.

5. Bovine and human types of tubercle bacilli are present in the tonsillar crypts of a small percentage of children without demonstrable tuberculous lesions either in the tonsils or elsewhere.

6. Tonsillectomy is essential in all cases of tuberculous cervical adenitis in children.

7. The prognosis is very slightly influenced in children in whom the faucial tonsils and cervical glands are simultaneously affected with tuberculosis.

8. The difficulties associated with the reform of the milk supply and the lengthened period which must elapse before it becomes possible to obtain a tubercle-free milk demand some means of rendering milk safe. The only immediate safeguard is to be had in the sterilization by boiling of milk for the artificial feeding of infants and the nourishment of all children.

INDICATIONS FOR OPERATION IN GLAUCOMA.

The *Pennsylvania Medical Journal* for February, 1918, contains an article by POSEY. He says the indications for operation in glaucoma should be:

1. In all cases of acute and subactute glaucoma, and in all chronic cases, on the manifestation of any inflammatory glaucomatous symptoms.

2. In all cases of chronic glaucoma in which there is a doubt of the patient's co-operation in the persistence in the myotic treatment throughout the remainder of life. This includes practically all hospital cases and such private patients as may be of a weak and vacillating disposition.

3. In all patients with chronic glaucoma who reside at such a distance from centers where proper ophthalmic care may be obtained that they are unable to report at sufficiently frequent intervals for the supervision necessary for the proper and safe carrying out of the myotic treatment, or for operation in the event that inflammatory symptoms arise.

4. In chronic cases in which the patients are under fifty-five years of age, when the field of vision and central vision are good, an operation on the most affected eye is advised, myotics being employed in both the operated and the unoperated eye for the remainder of life. Operation on the second eye should follow, if subsequent observation shows that vision is maintained better in the operated than in the unoperated eye.

5. In all cases of chronic glaucoma, without regard to age or the development of the disease, in which myotics have been given a faithful trial for at least six weeks or two months, as evidenced by the constant maintenance of pupillary contraction to almost pin-point size, and in which vision and the field of vision show progressive deterioriation.

In all cases not included under the five headings given above, myotics should be employed with great zealousness and persistence four times a day. Posey has reported elsewhere the value of this plan of treatment in maintaining vision for many years in a large group of cases, and he is convinced that if glaucoma is recognized as early as we now have measures at our command to insure, and if treatment is carried out along the lines he has indicated, the gloomy prognosis for sight so often rendered in cases of chronic glaucoma is unnecessary and unwarranted.

Cyclodialysis and trephining should be performed in all cases in which operation is demanded if there be a hemorrhagic tendency or the field of vision is very much reduced. The latter is to be preferred also in certain forms of secondary glaucoma. Iridectomy is the procedure of choice in all other cases. From his own observations and from considering the experience of others, Posey is convinced that the trephining operation is usually a more dangerous procedure than iridectomy, on account of the opacification of the lens that follows in not a small proportion of cases either immediately or remotely after the operation, and the danger of accidental infections in the subsequent course of the case. The claims of greater efficiency of the trephining operation made by some have not been proved by statistics, based on a sufficiently large number of cases observed for a considerable number of years after the trephining operation, which might serve as a basis of comparison with statistics such as those compiled by C. S. Bull and others, which show conclusively the postoperative effects of iridectomy. That trephining has the power to lower tension no one can deny, but that it is the most potent known operative measure in securing and retaining sight threatened by glaucoma, time and the conservative observation and report of a large number of cases will alone prove.

TREATMENT OF CENTRAL NERVOUS SYPHILIS.

In the *Lancet* of February 16, 1918, CARLILL concludes a long paper on this topic as follows:

1. The possibility of a syphilitic basis should be considered in every case of nervous disease.

2. Nervous syphilis can be proved by examination of the cerebrospinal fluid. The examination of the serum, whether the Wassermann reaction is positive or negative, is of little value in the diagnosis of these cases.

3. Provided that the diagnosis is made

early, and prompt treatment given in adequate quantity, syphilis of the nervous system appears to be curable in very many cases.

4. The real result of treatment can only be determined by repeated examination of the cerebrospinal fluid, hence the absolute necessity of painless lumbar puncture.

5. Cases in which this operation has been contraindicated have not been observed.

6. Some cases of curable meningovascular syphilis are diagnosed as incurable dementia paralytica, and treatment is withheld.

7. Even in some cases of long-standing tabes dorsalis the syphilis appears to be entirely curable by treatment, and in nearly all cases symptoms can be greatly alleviated by "606."

8. Novarsenobillon, in Carlill's hands, has proved a safe and most efficient remedy against the protean ravages of the *Spirochæta pallida.*

9. Galyl is not recommended.

10. The outlook of sufferers from early neurological syphilis is very bright, and will be brighter still when the general standard of knowledge of neurological diagnosis is less inadequate than it is to-day.

11. If the profession and the public seize and apply our present knowledge of syphilis it is not too much to hope that future generations of students will learn of tabes dorsalis and dementia paralytica only from the text-books.

12. Abolition of the ankle-jerks is an early sign, and often the only one, of arsenical neuritis, and may be demonstrated in the absence of any subjective symptoms.

PITUITRIN: ITS VALUE IN POSTOPERATIVE TREATMENT.

In the *New Orleans Medical and Surgical Journal* for March, 1918, DAVIS and OWENS point out that to avoid postoperative nausea and vomiting many devices have been evolved. Among these are numbered expertness on the part of the anesthetist in administering the anesthetic; hypodermic injection of morphine and atropine before the operation; washing out the stomach before the patient leaves the table; the use of various anesthetics, separately or in combination, as the open ether method, gas and oxygen, ethyl chloride, chloroform and open ether in sequence. The success that attends the use of these is variable and depends largely upon the individual anesthetist. Owens does not propose to occupy space with a discussion of these points, but he does want to direct attention to some of the work done by Davis and himself.

This work is a continuation of a series which Dr. Davis started in Australia, before coming to this country, and by means of their experiments they have been able to satisfy their patients and themselves that the bogey of postoperative gas pain is largely exaggerated. We all have had brought to our notice Crile's theory of anociassociation, and the plan by which he hopes to alleviate postoperative suffering by the use of local anesthetics. Many of us have undoubtedly seen the Mayos at work, and their skilful handling of viscera with a view to avoiding traumatism and paresis of the muscular coats of these organs. Both of these methods have unquestionably given wonderful results in the way of diminishing postoperative suffering, but few of us lay claim to the skill of these masters. Davis and Owens recognize their own shortcomings in the delicacy of touch of a Mayo, and they have been unable to obtain the results of Crile.

They have found, however, that the bogey of postoperative gas pains can be laid to rest by a much-discussed and abused drug, viz., pituitrin. Their investigation with this drug along these lines was purely accidental, and only confirms once again the old-time adage that "out of evil may come much good."

When pituitrin first came into prominence for the shortening of labor, Dr. Davis noticed in one unfortunate case that it produced a very marked contraction of the unstriped muscle of the uterus, and again, a few days later, that intestinal colic was

produced when it was administered to control menorrhagia. From this starting-point he began to inquire whether it would not act upon the unstriped muscle of the intestinal canal, and found, upon conducting a series of experiments with normal healthy individuals, that pituitrin, given hypodermically, 1 Cc. every four hours, caused cramping in the abdomen and frequency of defecation. Dr. Davis then determined to see if this action was present when the intestine and abdomen were not in a normal condition. He began to use pituitrin hypodermically in all abdominal operations, and the result has been completely satisfactory to him and to Dr. Owens. The individuals did not experience intestinal cramping, but the intestines were saved from that state of paresis which so commonly takes place after handling. It is this paresis which produces the accumulation of gas in the intestines, because of the failure of the normal peristaltic action of the bowel to propel it forward.

The method of using pituitrin was as follows: Morphine, gr. 1/6, and atropine, gr. 1/180, were given hypodermically one hour before operation. Immediately following the operation and before the patient was returned to bed 1 Cc. of pituitrin was given hypodermically. This dose was repeated two hours later, ½ Cc. given four hours after the operation, and another ½ Cc. eight hours after the operation. Unless the case was a very extensive one, involving considerable handling of the abdominal viscera, no more was given, but in these severe operations doses of ½ Cc. were continued every four hours until twenty-four hours after the operation, when 3 grains of calomel were given, one-half grain every half-hour, and this was followed by a saline purgative to prevent cramping. This series of experiments extends over 126 consecutive cases in which the abdomen was opened. Davis and Owens refrained from selecting special cases, in order that their results might have a general application. To avoid actual colic, they gave an enema four hours after the saline purge.

They arbitrarily divide their series of 126 cases into two groups: Group 1, cases in which there was not any septic peritonitis at the time of operation; Group 2, cases in which septic peritonitis was present at the time of operation.

The first group contained 104 cases and the second group 22. They watched the effects of the pituitrin clinically, and their results are expressed in the following tables:

Table 1—Group 1. Non-Septic Cases. Total, 104.

	Cases.
Flatus passed during the first 24 hours after operation	91
Rise of temperature above 100° F. any time during the first 48 hours	7
Increase of pulse-rate above 100 per minute any time in 48 hours	9
Gaseous distention of the abdomen so that dressing had to be loosened	6
Failure of bowels to act once in 36 hours	5

Table 2—Group 2. Septic Cases. Total, 22.

	Cases.
Flatus passed in 24 hours after operation	91
Rise of temperature above 100° F. any time in 48 hours	20
Increase of pulse-rate above 100 per minute in 48 hours	18
Gaseous distention of the abdomen so that dressing had to be loosened	11
Failure of bowels to act in 36 hours	9

The operations on the cases that comprised Group 1 were: Appendectomy, hysterectomy, salpingo-oöphorectomy, single or double; salpingectomy for ruptured extrauterine pregnancy, gastroenterostomy, strangulated hernia, intestinal obstruction, reduction of intussusception, cholecystotomy, cholecystectomy, suprapubic cystotomy, lateral enteroanastomosis, and splenectomy. The operations performed on the patients constituting Group 2 were: Efficient drainage for ruptured appendix, appendiceal abscess, ruptured hydatid cyst of the liver, perforated gastric ulcer, perforated duodenal ulcer, rupture of a strangulated ovarian cyst, accidental rupture of gangrenous intestine during resection of bowel, ruptured gall-bladder, and ruptured pyosalpinx.

It will be manifest that this series was thoroughly representative of abdominal sections and that no attempt was made to achieve results at the expense of selection of cases. As up to the present there has been considerable difference in strength in the standardized products of pituitary

gland of different manufacturers, a fact which has been amply brought out by Roth and by Hamilton and Rowe, and to provide uniformity and to eliminate the possible error that could have crept in from the use of different brands of pituitary extract of various manufacturers, Davis and Owens employed Parke, Davis & Company's standardized product entirely.

The mortality-rate in the series was gratifying, there being four deaths among the cases in Group 1, or slightly less than four per cent, while there were six deaths in the cases of Group 2, or a rate of twenty-seven per cent.

While Davis and Owens were conducting their series they met with nine cases of eclampsia, one of which terminated fatally within ten minutes of the first seizure. In seven cases the first fit occurred before the onset of labor; in one case the convulsions began during labor, while in the other case the first convulsion took place after the birth of the child, but before delivery of the placenta. In all cases pituitrin was given along the lines previously outlined, except that its use was kept up for seventy-two to ninety-six hours. They noticed that secretion of urine commenced earlier and was less scanty than in cases in their practice prior to these experiments.

As regards the use of pituitrin to shorten the time of labor, Davis and Owens want to say that they have long abandoned this drug for that purpose, as their experience has shown that it is as dangerous as ergot and should not be used until after the expulsion of the placenta, and then only to anticipate postpartum hemorrhage.

The conclusions drawn from their series of experiments are:

First, that pituitrin is a valuable drug stimulating the muscular coat of the intestine after abdominal section in non-septic cases.

Second, that it is of decided assistance in preventing postoperative shock after abdominal section in non-septic cases, as evidenced by the lack of rise of temperature and pulse-rate.

Third, that it had very little, if any, effect upon cases complicated with septic peritonitis, but their results in this group are inconclusive, on account of the small number of cases.

Fourth, that it stimulates the secretory action of the kidneys in cases of eclampsia.

Fifth, that it materially reduces the amount of postoperative suffering.

INTESTINAL INTOXICATION IN INFANTS.

In the *American Journal of Diseases of Children* for March, 1918, SCHLOSS states that in intestinal intoxication there is a marked increase in the non-protein nitrogen and urea of the blood. This increase is not due directly to increased concentration of the blood from loss of water. The high non-protein nitrogen and urea are due to defective kidney elimination.

The renal lesions in intestinal intoxication are not sufficient to account for the impaired elimination by the kidney. It is probably due to the fact that lack of water restricts the formation of urine. This condition is probably due to the following factors, which may act singly or in combination: (1) The loss of water in the stools is so great that it is impossible for the infant to ingest sufficient fluid to replace the loss. (2) The patient refuses to ingest fluid or vomits practically all that is taken. As a result the tissues become dehydrated. The retention of nitrogenous waste products and the failure of the kidney to do its part in preserving the acid-base equilibrium result from the deficient secretion of the urine. The oliguria may be due to the fact that the dehydrated tissues hold as much water as possible so that none is available for the formation of urine. Other factors, dependent mainly on the loss of water, which may play a rôle are: (1) An increase in the concentration of blood colloids to such degree that the osmotic pressure is greater than the arterial pressure in the kidney; (2) a diminution in the total blood volume leading to decreased blood-flow through the kidney.

The symptoms of intestinal intoxication are essentially those of uremia. The two conditions are similar in all essentials. In one, defective kidney function is due to an organic lesion; in the other it results from the negative water balance and consequent oliguria.

Acidosis plays a definite part in the symptomatology of intestinal intoxication, but the essential cause is probably some unknown toxic agent.

DIGITALIS AND THE CONTROL OF AURICULAR FIBRILLATION AND AURICULAR FLUTTER.

In the *American Journal of the Medical Sciences* for March, 1918, HALSEY points out that many cases of flutter have been reported which have been changed to fibrillation, and subsequently, after slowing by digitalis, have resumed their normal sequential rhythm. This is the aim and hope of the procedure.

The employment of digitalis to effect the rhythm as shown in these cases should not permit us to forget that such use depends on the accurate diagnosis of the condition. If there is doubt as to the cause of pulse-frequency one should hesitate in the administration of such doses of digitalis, for the production of fibrillation in an otherwise healthy heart would not be desirable nor justifiable.

1. The gross irregularity of the ventricle in cases with fibrillation of the auricle can be controlled by digitalis if sufficient drug is exhibited.

2. The patient should be instructed to continue the use of digitalis for the remainder of life, and should be taught how to determine the amount of the dose necessary from day to day to control the heart-rate. Give sufficient drug to maintain the rate of the ventricle below 70 per minute when counted after a rest in the late afternoon.

3. The fibrillating auricle under a short course of digitalis may return to normal rhythm.

4. In auricular flutter the aim of treatment with digitalis is to produce auricular fibrillation and then control the rate of the ventricle with digitalis, hoping in the favorable cases for a renewal of normal sequential rhythm.

NON-OPERATIVE TREATMENT OF NASAL SINUSITIS.

To the *Pennsylvania Medical Journal* for February, 1918, VANSANT contributes a paper bearing this title.

If Vansant should be asked to outline the steps of a conservative treatment that, in his opinion, would promise the greatest success, it would be as follows: After a very careful examination and diagnosis, and, if possible, removal of intranasal obstructions, the nasal chambers should be cocainized, nasal plugs saturated with argyrol and glycerin inserted and allowed to remain in place until active discharge ceases; this should be followed by the use of the suction apparatus. After this, an effort should be made to force medicated fluids or vapors into the sinuses either with the Coffin apparatus or the hot-air syringe. All this treatment is carried out in the office. For home treatment the patient should use a cleansing wash, and the general practitioner should institute whatever general treatment is necessary. If the above treatment does not obtain a favorable result in a short time, vaccine hypodermic injections should be added to the local treatment. These injections are usually given in the office and should be repeated every three or five days.

Finally, no one wishes to claim absolute cures from any treatment, either surgical or non-surgical. We should always remember that a tissue, once damaged, is generally more liable to future trouble than before the damage; also, that the thorough eradication of a local sepsis, situated in deep cavities, is a very difficult matter, but the above-mentioned treatment has placed many patients under Vansant's care in a condition entirely satisfactory to themselves, with total absence of pus discharge, and they have continued to remain in the improved condition.

TEN YEARS OF SERUM TREATMENT IN HYPERTHYROIDISM.

BEEBE (*Interstate Medical Journal*, February, 1918) observes that the fundamental premise at the basis of the serum treatment is the assumption that thyroid gland during periods of overactivity passes into the circulation in excessive amounts as physiologically active protein. The second premise is the assumption that antiserum can be developed against this protein by inoculating it into an alien species of animal. During the last ten years he states that the antithyroid serum thus prepared has been given to more than 4000 human patients. Approximately 20 per cent of all the types of disease do not benefit by serum injections. In 80 per cent of all patients treated the serum proves serviceable.

The beginning doses administered subcutaneously are small, in most cases from 2 to 4 minims, repeated every second day, gradually increasing the dose until the subject becomes tolerant, reaching in the course of three to four weeks the full dose of 14 to 20 minims. If a full dose of 15 minims is given every day or every second day in the beginning of treatment, the results are almost sure to be disastrous from severe local reactions developing at the point of injection, together with fever. With gradually increasing doses these injections can be made without discomfort. Patients who had injections continued for a period of more than a year during the course of treatment and who remained well for periods of five to ten years seemed a fairly conclusive refutation of the idea that dangerous side effects have been caused in their tissues. In addition to the serum treatment Beebe advises rest — mental, physical, emotional; a rigid meat-free diet, and exclusion of all forms of stimulants, such as tea, coffee, and alcoholics; administration of antithyroid serum; clearing up of all chronic infections; maintenance of hygienic conditions of the intestinal tract; the judicous administration of small doses of iodine, always in the form of potassium iodide. This agent is not indicated in all cases, and is used only when the intense overactivity has been controlled.

The proper use at the right period of the treatment of suitable doses of *x*-ray.

The administration of neutral hydrobromide of quinine in a small percentage of patients during the later periods of treatment.

INJURIES OF THE SPINAL CORD.

SCHACHNER (*Maryland Medical Journal*, February, 1918) in the record of a most interesting case of the removal of a projectile from the spinal cord, speaks of concussion as an impairment or loss of function without the existence of gross anatomic cord changes. Bailey is quoted to the effect that "to the impartial observer the conviction must be inevitable that the weight of evidence is against the existence of the condition."

Barker's classification of traumatic hematomyelia is cited—*i.e.*, local, profuse local, disseminated, and profuse disseminated. Compression of the cord may be due primarily to the presence of a projectile or other substance, or a portion of a vertebra impinging upon the cord. Secondarily, the compression may be due to edema or hemorrhage. According to Bruns, the segmental root pains, indicating the level of the lesion, are due to compression of the segment from which the root springs and not to pressure upon the root in its intraspinal course.

The hemorrhage may be extradural, intradural, or both extra- and intradural, or into the cord substance (hematomyelia). In the latter case it may give rise to a cyst which may be responsible for traumatic syringomyelia. The presence of hematorrhachis is confirmed by lumbar puncture, which may also have its therapeutic value by relieving pressure. Twenty to thirty cubic centimeters of fluid should be drawn off. Hematomyelia is more common than is suspected. Six out of his 21 cases of injury to the cervical spine showed hemorrhage into the cord, and unaccompanied by

any apparent injury to the column itself. Such injuries occur usually in the cervical region and are due to flexion. The hemorrhage selects gray matter from the white because the vessels are less firmly supported in the gray matter. The lower cervical region, primarily the eighth cervical, is considered the favorable region for hematomyelia.

According to Thomas, the factors in drawing the conclusion that there is a complete transverse lesion of the cord are:

Complete paralysis usually of the flaccid type.

A complete loss of sensation in all its forms.

Absent reflexes, especially the knee-jerk, while the plantar reflex, on the contrary, is often retained.

Complete paralysis of the bladder and rectum, with priapism.

Vasomotor paralysis, with severe sweating in the paralyzed parts.

And most important, absence of variations in the symptoms.

Absence of irritative phenomena, such as pain.

Walton, who has studied fractures of the spine, states there are no symptoms which establish (otherwise than through their persistence) irremediable crush of the cord. While total relaxed paralysis anesthesia of abrupt demarcation, total loss of reflexes, retention, priapism, and tympanites, if persistent, point to complete and incurable transverse lesion, the onset of such symptoms does not preclude a certain degree, at least, of restoration of function. He also states that we have no infallible guide to the extent of the lesions.

A careful consideration of the spinal injuries, as they are revealed in literature, justifies one in emphasizing the importance of not too readily dismissing injuries of the back as sprains; and sprains of the back that persist should be carefully examined, and, if necessary, *x*-rayed.

No effort should be made to elicit crepitus in injuries of the cervical region. This should be replaced by the Roentgen ray. In the first-aid handling of the subjects suspected of spinal injury, it is desirable to exercise care and to keep and transport them as much as possible in the position in which they are found, until more definite information as to the nature of the injury is obtained. It seems needless to say that an air or water bed and catheterization under the strictest precautions should be carried out. Shock, which is rarely absent, is the first indication.

The Roentgen ray, spinal puncture, and a careful neurological study are the diagnostic triad upon which we are dependent. The radiogram should be studied stereoptically. The spinal puncture will not only afford data as to the existence of a hematorrhachis, but, through the withdrawal of fluid, will relieve the pressure. It will not permit of a differentiation between a hematorrhachis and hematomyelia. The symptom-complex of both is similar. In meningeal hemorrhage the chief stress is laid upon the irritative phenomenon, acute and immediate spinal pain increased by spinal movement. Radiating pains from the supposed pressure of the blood on the spinal root and referred over their distribution is characteristic, and on it Kocher lays especial stress.

In intramedullary hemorrhage the paralysis is frequently of the Brown-Sequard type, due to unilateral compression, and may increase in keeping with the hematomyelia. The duration of symptoms in hematomyelia is longer than in hematorrhachis, and, owing to the tendency to a syringomyelia, may leave permanent traces.

The examination of the spinal fluid will set at rest the question of infection, should this be suspected.

Nowhere is timeliness more important than in spinal surgery. After the subsidence of shock and the adjustment of the nervous system to a condition where some conclusion can with more safety be drawn, the earlier the operation is performed the better.

Degeneration is by many supposed to begin about the fourth day. In cases in which a careful study justifies the opinion of a complete transverse lesion, or in which it is believed to be a contusion or hemato-

myelia, operation is contraindicated. In the first instance it is generally considered hopeless, except in the caudal zone, and in the other instance it is useless. Where, however, the evidence is not absolutely convincing, especially after a cautious delay and reasonable doubt still exists, exploration should prevail.

If modern surgery can lay claim to any achievement, it is the elimination of doubt, through cautious exploration, and the fact that some explorations can be shown to be useless, or even a few fatal, does not, in the writer's judgment, invalidate the broad application of the rule.

VESTIBULAR APPARATUS IN RELATION TO AVIATION.

MURRAY (*Journal-Lancet*, March 15, 1918) observes that within the membranous labyrinth of the internal ear are two distinct and separately functionating organs, the cochlea and the static labyrinth. Within the cochlea, which is the end organ of hearing, is distributed the cochlear branch of the auditory nerve. The static labyrinth, which is the sense organ of equilibrium, receives its nerve supply from the vestibular branch of the auditory nerve, and contains the sacculus, the utriculus, and three semicircular canals. The two special sense organs, the cochlea and the static labyrinth, are more or less independent of each other as regards their physiology and pathology; and while both may be involved and their functions inhibited or suppressed, it frequently happens that the vestibular portion of the eighth nerve may alone become involved, and the hearing remain normal.

It is to Barany that we are chiefly indebted for our knowledge of the physiology and pathology of the static labyrinth and for our method of testing its integrity. The ability of the individual to maintain his equilibrium depends upon his vestibular apparatus, his visual apparatus, and his muscle sense. Deprived of one of these factors in maintaining balance, he is still able to maintain his equilibrium; deprived of two of these factors, serious trouble follows. This is illustrated in the case of the tabetic who has an impaired muscle or arthrodial sense. As long as he has his eyesight and unimpaired vestibular apparatus, he is able to maintain his balance. When he closes his eyes, there follows an imbalance. In the case of the deaf-mute who has a destruction of both internal ears, he is able to maintain his balance as long as he has his sight and arthrodial sense; and the blind person is able to maintain his balance as long as he has a functionating vestibular apparatus, and his muscle sense is unimpaired. Hence, it becomes of the utmost importance that the aviator should possess a perfect vestibular apparatus, perfect eyesight, and an unimpaired muscle sense. The most important of these is a perfectly functionating vestibular apparatus.

The method of examining the vestibular apparatus has been standardized by the U. S. Army, and is carried out by means of the turning-chair, supplemented by the use of the caloric tests in doubtful cases.

The reactions elicited by revolving an individual in the turning-chair depend upon the movement of the endo-lymph within the semicircular canals. This movement of the lymph, set in motion by the turning, stimulates the hair cells within the canals, and this stimulus is conducted along the pathway of that particular set of canals to the eye-muscle nuclei and to the cortical brain centers, giving rise to the definite phenomena of nystagmus and vertigo. If these reactions are normal for each set of canals, they indicate normal functionating power of the entire vestibular apparatus, which includes the static labyrinth and nerve tracts to the eye muscles and brain centers.

Nystagmus results from the stimulus passing from the semicircular canals to the eye-muscle nuclei and the eye muscles, and vertigo results from the stimulus passing from the semicircular canals to the cerebellar nuclei and thence to the temporal lobe cortex.

The three semicircular canals are placed in three planes at right angles to each other, and each canal, when stimulated, produces a nystagmus corresponding to its own

plane, and this nystagmus is increased by turning the eyes in the direction of the rapid movement of the nystagmus. The horizontal canals produce a horizontal nystagmus, the front canals produce a rotary nystagmus, and the sagittal canals a vertical nystagmus. Nystagmus due to vestibular irritation is a rhythmic nystagmus, and consists of a slow movement of the eyeballs in one direction followed by a rapid movement in the opposite direction. The direction of the nystagmus is indicated by the direction of the quick movement.

The stimuli usually employed to produce a physiological nystagmus are syringing the ear with cold water, at a temperature of 68° F., and rotating the patient in the turning-chair. In testing a given set of semicircular canals for nystagmus by means of the turning-chair the particular set of canals under examination must be brought into the horizontal position. In testing the horizontal semicircular canals the head is tilted forward 30 degrees, and fixed in that position by means of a properly tilted head-rest.

If the frontal canals are to be tested for nystagmus, the head is tilted forward 120 degrees to bring the frontal canals into the horizontal position, and the chair is rotated. This is followed by a rotatory nystagmus, the rapid movement of the nystagmus being in the direction in which the chair is turned. If we wish to test the sagittal canals, the head is inclined toward the right or left shoulder, when rotation causes a vertical nystagmus.

In order to standardize the results obtained in testing for nystagmus, it is necessary to revolve the turning-chair a certain number of times in a certain number of seconds. Jones and Fisher have found that the normal duration of the nystagmus from the horizontal semicircular canals is twenty-six seconds when the chair is turned ten times in twenty seconds. In examining the horizontal canals for nystagmus the subject is seated in the turning-chair, with head fixed at 30 degrees forward and eyes closed, and the chair is revolved to the right ten times in twenty seconds. The chair is stopped, the patient immediately opens his eyes and looks straight in front of him at some distant object, and the duration, amplitude, and direction of the nystagmus are recorded. The chair is then turned to the left, and the results similarly noted. In the examination of candidates for the aviation service, a leeway of ten seconds is allowed in the duration of the nystagmus; that is, a nystagmus duration of from sixteen to thirty-six seconds. If nystagmus is absent or of less than sixteen seconds' duration, it indicates a corresponding degree of functional impairment of the semicircular canals or of the nerve tracts leading from those canals to the eye muscles. If the nystagmus duration is more than thirty-six seconds, it indicates a hypersensitive condition of that portion of the vestibular tract that would make that particular individual an undesirable subject for the aviation service.

Nystagmus and vertigo are distinct and separate phenomena, independent of each other, and produced by stimuli passing along different tracts from the semicircular canals to the brain centers. In testing the horizontal set of canals for vertigo, the head is fixed at 30 degrees forward, the eyes are blindfolded, and the chair is revolved rapidly to the right, ten times in ten seconds, and brought to a stop by means of the stop-pedal. The outstretched finger of the subject is quickly placed upon the finger of the examiner, and he is told to raise his arm straight above the shoulder and bring his finger down upon the examiner's finger. If the horizontal canals are normally functionating, the patient will "past-point" to the right of the examiner's finger. The left arm is quickly tested in the same way, and testing of the right and left arms is continued as long as there is any past-pointing. The patient is then turned to the left; and the right and left arm are similarly tested. The past-pointing is due to the vertigo, and the subject continues to past-point as long as the vertigo lasts. While the chair is being turned, the subject feels that he is turning in the same direction as the turning of the chair; but when the chair is stopped

he feels that he is still turning, but in a direction opposite to that of the actual turning of the chair. In his efforts to find the examiner's finger he reaches back and past-points. The past-pointing is in a direction opposite to that of the vertigo, but in the same direction as that in which the chair was turned. The distance to which he past-points to the right or left depends upon the extent of the vertigo, and gradually diminishes, as the vertigo subsides, until the finger is brought down directly upon the finger of the examiner. In testing the vertical semicircular canals and their tracts for vertigo, the head is placed forward 120 degrees, because the turning affects only those canals which are in a horizontal plane. This may be done by means of the "falling test." In this test the patient's head is inclined forward 120 degrees, which brings the frontal canals into a horizontal position. This is done by having him rest his forehead on a suitable support attached to a horizontal bar on the front of the chair. With eyes closed, he is turned five times in ten seconds, and on stopping the chair he sits upright, and, on account of the vertigo induced by the turning, he falls to the right. It is only when he raises his head that there is a tendency to fall. As long as his head is inclined forward and his frontal canals in a horizontal position, he has a sensation of turning in a plane parallel with the floor, and there is no falling. On raising his head to the upright position, the frontal canals are brought into a vertical position, and he immediately feels that he is revolving in a plane at right angles to the floor, and he falls in the direction in which the chair was turned. The chair is then turned to the left in a similar manner, and falling to the left occurs. These are normal physiological reactions, and failure to obtain them indicates a functional impairment of that part of the vestibular apparatus under examination.

Testing the semicircular canals and their tracts for nystagmus and vertigo may be done by means of the caloric tests, as devised by Barany, and has the advantage of enabling us to test each canal of one labyrinth only, while the turning tests give reactions from both labyrinths at the same time. The nystagmus and vertigo induced by the caloric tests are caused by the movement of the endo-lymph within the semicircular canal brought about by directing a stream of cold or hot water against the drum membrane. Preference is given to the use of cold water, at a temperature of 68° F., which is directed in a steady stream against the drum membrane.

WOUND FLORA IN RELATION TO SECONDARY SUTURE.

Munroe, McGill, Fleming and Janes (*British Medical Journal*, Feb. 9, 1918) note that the sterilization of septic wounds followed by secondary suture or closure, having for its objects the shortening of the patient's stay in hospital and the lessening of impairment of function, is the ambition of most army hospitals to-day.

The flora of all septic wounds consists of a conglomerate variety of bacteria—staphylococcus, streptococcus, pyocyaneus, welchii group, and bacilli with end or central spores, etc. On analyzing fifty cases of secondary closure it has been noted that in all failures the anaerobic culture showed they had previously had to deal with a very active infection, which digested the meat medium rapidly and gave off abundance of gas with rotten-egg odor. The cultures obtained showed in some cases infection by an active streptococcus, in others by a spore-forming bacillus. In both cases, even when the bacterial count was low, the wounds so infected broke down on secondary suture. On the other hand, where the cultures obtained showed an absence of these particular groups of bacteria, and the meat medium was unchanged, wounds were closed successfully, even when affording a comparatively high bacterial count (20 to 30 per microscopic field).

Where the anaerobic culture shows a virulent infection, and where the culture obtained shows spore-forming bacilli, it would be advisable not to attempt secondary suture until the wound is absolutely sterile.

After making many bacterial counts as a routine procedure in wounds, especially those which were being treated by the Carrel-Dakin method, it appeared that although the factor of the bacterial count was not an absolute guide it was of very considerable help, and a fair indication as to the progress of the combat between the tissues and the infection. Nevertheless, it seemed that other factors came into play, and it occurred to the authors that possibly the most important of these was the particular bacteria present in a particular wound. Accordingly it was decided to make cultures from a series of wounds with a view to determining the total bacterial flora of each, both aerobic and anaerobic.

A swab is taken from the wound either the day following or, where the wound is very dirty, within two or three days after the patient arrives in hospital from France. This is planted in nutrient bouillon and in the meat medium recommended by the Tetanus Committee for the growth of anaerobes.

It seems advisable either not to inactivate the meat medium after inoculating with a view to eliminating all but spore-forming organism, or, if this be done, to run two cultures, one of which has been inactivated and one not, as the action of the facultative anaerobes on the medium appears to afford a clue to the virulence of the infection.

The broth culture is examined at the end of twenty-four hours and the findings recorded. The anaerobic culture is examined daily as to the bacteria present, color, gas formation, digestion, and odor, and the findings recorded. These examinations are carried out until it is apparent that nothing more is to be gained. A culture which has at any time shown B. welchii or bacilli of the malignant edema group is usually carried on for two or three weeks unless bacilli of the end-sporing group appear before this time.

In attempting to judge of the virulence of the streptococci attention has been paid to the effect on the meat medium, the length of the chains formed, and the extent to which the streptococci dominate the culture. Certain forms of streptococci rapidly digest and darken meat, produce gas, and even a disagreeable odor. These are considered virulent. Others, although a good growth is obtained, leave the medium unchanged. These have been regarded as the less virulent. Along with streptococcus, the B. welchii is found almost constantly, and in doing bacterial counts this organism in many instances accounts for a large percentage of the bacteria counted, although it would not appear to be an important factor in the healing of the wound. Streptococcus is the most persistent of all organisms they have found.

The malignant edema group of organisms has been active on the meat culture, rapidly digesting it, forming gas, darkening it to brownish-black or even black, and producing an extremely disagreeable odor like that of rotten eggs. These have been regarded as a dangerous infection, even in the presence of a low bacterial count. The fact that the bacillus of malignant edema may, in a non-inactivated culture, occasionally be mistaken for one of the B. welchii group, does not seem to be of great practical importance, as the identity of the malignant edema group is later shown by the formation of the typical spores and the effect on the medium. Further, there is undoubtedly such a relationship between the occurrence of the two groups that where B. welchii is found one would hesitate in saying the other group is absent.

End-sporing bacilli, oval and round, have been found in a small percentage of cases. Among these may be mentioned a stump which repeatedly broke down, and a replating of femur for malposition which broke down, although the original wound had been completely healed for a period of six months.

It is within the power of many if not most of the laboratories now attached to the general hospitals in England to make cultures from almost if not all wounds in the hospitals where a secondary suture is likely to be undertaken. It is the cases which early show a low bacterial count that

the kind of organism present is of prime importance. At the end of a week or ten days the culture will have shown whether or not there is an extensive or virulent infection present, which it is probably not going to be advisable to close in by secondary suture.

A CASE OF RAT-BITE FEVER TREATED SUCCESSFULLY BY INJECTIONS OF NOVARSENOBILLON.

Low and Cockin (*British Medical Journal*, Feb. 16, 1918) report a case of rat-bite fever cured by injections of novarsenobillon. This comparatively rare disease is due, as shown by Futaki, to the presence of long and short spirochetes, the latter being the younger. The patient was aged twenty-five, an East African, and was bitten by a rat on the back of the right forearm. The wound healed up, but seven days later became painful and swollen. Thereafter fever developed and a rash broke out over the body. Later the glands of the right axilla enlarged, and following this a general adenitis was noticed. The twelfth day after the onset of symptoms the bite, which had now broken down, was lanced and some pus escaped. About the twentieth day severe joint and bone pains came on. The throat became inflamed and sore. The condition improved, but relapsed again and recurred at various intervals. It is worthy of note that malarial organisms were also found in the patient's blood. He showed a positive Wassermann, as is usually the case with other spirochetal diseases. There was clinically no suspicion of syphilis, nor trypanosomiasis. The response to arsenic was prompt and satisfactory.

TREATMENT OF WOUNDS OF THE CHEST.

Hutchinson (*British Medical Journal*, Feb. 16, 1918) notes that at the beginning of the war the question of major interest was as to aspiration of hemothorax and as to whether or not aspiration of blood was worth while. Aspiration very quickly became a routine procedure, and was followed by replacing the aspirated blood with oxygen in order to do away with the disagreeable symptoms sometimes produced by the rapid removal of a large quantity of fluid from the pleural cavity. Thus, he states, perfection was reached in so far as the treatment of simple hemothorax was concerned. There are other problems more striking, to-wit: how to deal with an open pneumothorax; how to deal with an infected hemothorax; how to deal with a foreign body in the lung.

The treatment of a simple non-infected hemothorax or a pneumohemothorax consists in merely aspirating the blood from the pleural cavity. This should be carried out in all cases in which more than two fingerbreadths of dulness can be made out. In the author's series of 450 cases 368 were aspirated; in the remainder there was not sufficient fluid to warrant it. The aspiration is done by means of the ordinary aspirating apparatus, but there are one or two practical points which, if carried out, make the procedure easier both for the patient and the surgeon. A local anesthetic should be injected into the skin, muscles, and pleura in order to make the aspiration as painless as possible. After the injection of the anesthetic a tiny incision should be made through the skin so that the round cannula will not be gripped by it. In the next place it is important to use a fair-sized trocar, as small needles are very easily blocked; another advantage in using a trocar is that when the sharp obturator is removed the blunt cannula can be moved about the pleural cavity without damaging the lung. If during the aspiration the patient begins to suffer pain in the chest and shortness of breath, the trocar can be disconnected from the bottle and a little air allowed to enter the pleural cavity, and it will then be found that more blood can be withdrawn before the pain and distress returns. In commencing to aspirate a chest, especially in cases in which a quantity of air is present in the pleural cavity, the bottle should not be exhausted before the trocar is connected, but should be exhausted grad-

ually during the whole aspiration, as the sudden evacuation of air when the tap is opened might cause alarming symptoms.

The treatment of non-infected hemothorax in which there is a large amount of blood-clot requires special mention, as there is a difference of opinion as to the course to be pursued. Personally, the author believes the chest should be opened, all the blood and clot removed, the pleural cavity closed, and the air aspirated. The author recommends that this be done as early as the patient's condition will permit, as then the lung will get a chance to expand before adhesions form. There are two reasons for this: first, the removal of the blood and clot by aspiration is impossible, and therefore we must depend upon absorption to remove them, and as this is necessarily a slow process the lung remains compressed for a long time and adhesions between the compressed lung and the chest wall become very firm; secondly, these cases in the author's experience formed the great bulk of the infected ones, and he is confident that had they been treated by operation in the first place they would have escaped infection.

The treatment of an open pneumothorax has been greatly improved during the past year, and the results obtained at the casualty clearing hospitals are very encouraging. In this condition it is important to clean the wound thoroughly, to wash out the pleural cavity with saline, and to close the chest completely. This should be done early, as the condition of shock will be relieved by the closure and the danger of infection also decreased. If the patient's condition will stand it and the foreign body is fairly accessible it should be removed. If there seems a likelihood of infection having taken place, then 3 ounces of 1-in-5000 flavine solution should be left in the pleural cavity and the usual after-treatment of an infected hemothorax carried out.

Simple aspiration in infected cases is of no avail, as in the first place it is impossible to remove all the blood from the chest by this means, and in the second place the clot, in which lies the focus of infection, cannot possibly be removed through a trocar. Again, it is impossible to sterilize the clot by any known antiseptic which can be used in the pleural cavity, and therefore the only possible means of treating these infected cases is by operation.

The method to be applied in these cases is as follows: As soon as a hemothorax is found to be infected, that is, clinically and bacteriologically (not merely bacteriologically), the patient is taken to the operating-room and nitrous oxide and oxygen administered. A portion of rib, long enough to allow the hand to be passed through the opening, should be removed and the blood allowed to flow out. The clot is then removed by the hand, all parts of the cavity explored, and light adhesions broken down. Then by means of large pieces of gauze on dressing forceps the remainder of blood and clot is removed. After this the cavity should be washed out with saline and again mopped out, and a running suture inserted in such a way as to include the pleura and intercostal muscles. This suture should be left quite loose, so that a small quantity of some antiseptic can be poured into the pleural cavity. This antiseptic should be spread all over the walls of the cavity by means of a small piece of gauze on long dressing forceps. As soon as this has been done the running suture is drawn tight, thus closing the pleural cavity completely. The muscles and skin are then closed and a dry dressing applied.

Forty-eight hours after the operation the chest should be aspirated, thus removing a quantity of serum and air. This is done for two reasons: first, the serum by that time has lost its bactericidal properties, and then only becomes a menace; and secondly, by removing a good deal of the air from the pleural cavity a negative pressure is obtained which helps to reëxpand the lung. It will be found that three or four aspirations are necessary during the course of convalescence.

The antiseptics which the author has used in these cases include eusol solution, 1 in 2; a suspension of bipp in liquid paraffin in the following proportions: bipp ½ oz., liquid paraffin 6 oz., flavine solution 1

in 5000, and normal saline, the amount left in the chest being 3 ounces.

Of 29 cases thus treated 16 remained closed; 11 of this number having been treated by bipp 1½ ounces and liquid paraffin 6 ounces. The infections by the B. aerogenes capsulatus do better than those from other germs. Of seven streptococcic cases six had afterward to be reopened. The author warns against constant washing of the pleural cavity in early cases, and advises filling of the cavity with a eusol solution 1 in 3 and good drainage. The patient is turned on his sound side, the cavity filled with eusol, and then turned over in such position that the eusol drains out. This is repeated every second or third day.

As a result of experience with 450 cases, and from reports received from other surgeons similarly experienced, the author is convinced that no attempt should be made to remove a foreign body from the lung while the patient is in a base hospital in France. Among these 450 cases there were 27 deaths. He further believes that all cases of wounds of the chest should be treated in special wards of special hospitals; that temperature, pulse, and respiration should be recorded four times a day; that cases in which there is more than two fingerbreadths of dulness should be aspirated. The postoperative aspiration must be done in all closed cases in the first forty-eight hours after operation.

In this relation Stoney's communication (*British Medical Journal*, Feb. 16, 1918) is of interest, he reporting three cases corroborating the above. He expresses himself to the effect that an empyema can be cured even when the cavity of the pleura is not obliterated either by distention of the lung or prolapse of the chest wall. He believes that most if not all cases of empyema can be cured without resort to such mutilating and dangerous operations as thoracoplasty and pulmonary decortication, because it is not necessary to obliterate the pleural space, but merely to render its walls sterile, and this is possible by frequent washings with hypochlorite solutions.

Flushing of the pleural cavity with hypochlorite solution is not dangerous provided there is a free exit for the fluid, as by the use of a double drainage tube.

The earlier this treatment is instituted the sooner and more surely will a cure be obtained, as there will be less formation of granulation and scar tissue, and the organisms will not have had time to entrench themselves deeply in the tissues, and will therefore be more exposed to the action of the antiseptic.

The drainage should be free, and the opening should not be valvular; if a Carrel tube is used it should be introduced as far as possible into the pleural cavity through a large drainage tube, so that the fluid, starting at the most remote part of the septic space, passes down over its walls and escapes freely between the Carrel tube and the drainage tube.

The opening is most suitably made by removing one inch of the eighth rib in the scapular line, as this is the most dependent spot for practically all positions, and there is no fear of its closure by the rising diaphragm.

ACIDEMIA IN GAS GANGRENE.

WRIGHT and FLEMING (*Lancet*, Feb. 9, 1918) summarize previous communications on this subject as follows:

The bacillus of Welch when cultivated in serum renders that medium acid; the normal blood fluids by virtue of their alkalinity and antitryptic power antagonize the growth of the bacillus; the blood fluids become a very favorable culture medium for the organism when we blunt off their alkalinity by acid, or their antitryptic power by trypsin, and more conspicuously when we do both; the septicemic gas infection which develops in an animal killed and incubated after intravenous inoculation with the microbe is associated with the development of the post-mortem acidosis; in the living animal the evolution of gas gangrene marches hand in hand with a local and general acidosis; in man the characteristic toxemia of gas gangrene is correlated with

the supervention of a very severe acidosis; and an immediate improvement in the clinical condition of the patient is obtained by the intravenous injection of alkali.

Air-hunger is not, as it ought to be, a feature, and an outstanding feature, in the clinical picture of gas-gangrene toxemia. Nor is there in the toxemia of gas gangrene anything else to remind us of the classical symptoms of acidosis.

From the contention that air-hunger does not enter into the picture of gas-gangrene toxemia the appeal is to the clinical facts. In the large majority of cases of gas gangrene there is well-marked hyperpnea; in some, quite classical air-hunger; and where this symptom is absent it is because the agonal cold is already creeping up over the gas-gangrene patient. In such circumstances with internal respiration practically extinguished and the pouring into the blood of CO_2 and further acid products excluded, air-hunger is obviously ruled out.

That the clinical picture of gas-gangrene toxemia fails to correspond with the mental picture of acidosis may depend upon the mental picture having been arrived at by erroneous generalization.

The constitutional symptoms common to all these forms of acidosis would seem to be two: First, the hyperpnea. With respect to this, though an outstanding symptom when muscular exercise puts a strain upon the respiratory mechanism, hyperpnea may easily cease to be apparent or even make default when the patient is at complete rest and the internal respiration is cut down. The second important clinical feature of acidosis is that the life of the patient or experimental animal in this condition hangs upon a thread. We leave our gas-gangrene patient for an hour, and we come back and find him dead. The same holds of the cholera patient. The diabetic coma and the nephritic patient may also go out very suddenly. And in the accounts of ship scurvy —and in particular in that memorable account in Lord Anson's "Voyage of the Centurion"—there is constant reference to patients dying quite without warning, and to death being wont to follow very suddenly upon the least physical exertion. Exactly the same holds of the "acid rabbit." To these clinical features may be added a third. Nephritic, and in particular scorbutic, and gas-gangrene patients have a sallow, earthy aspect which immediately brings up to the mind of those familiar with the facies the possibility of acidosis.

In the matter of local manifestations there would appear to be—but, of course, the symptomatology will here vary with the local source of the acid—a disposition to serous effusion into the tissues, and in particular (perhaps here to rectify the local acidosis) an effusion into the site of the acid production. Fischer, in his work on nephritis, has drawn special attention to acidosis as a cause of inhibition, and very probably this factor does play a part in the causation of edema in the nephritic. The same almost certainly holds true of gas gangrene. We have there a very conspicuous serous infiltration of the tissues, and the microbic invasion of the subcutaneous tissues is preceded by an advance wave of diminished alkalinity marked out by a purplish mottling of the skin. In scurvy also we have, in the infant, as a characteristic early symptom, muscular pain and tenderness, which probably speak of effusion. In the accounts of land scurvy, such as those in Calvert's collection of the "Travels of the Early Explorers of Australia," we have frequently recurring references to painful effusions in the calf and thigh; and in Lord Anson's Voyage and the works of Lind on sea scurvy we have accounts of anasarca and effusion into serous cavities. Out of all these elements, and such others as may perhaps present themselves in connection with still undescribed forms of acidosis, the clinician of the future will build up an accurate generalized picture of its symptomatology. In time of war, having laid a sufficient foundation of pathological observation, the pressing task is to get on to the effective treatment of the acidosis of gas gangrene.

The treatment of the acidemia of gas-

gangrene toxemia follows directly from its pathology.

The authors have employed, as is done in grave diabetic acidosis, intravenous injections of alkali, following these up, where a relapse had to be guarded against, by lactate of soda administered by the mouth in doses of 8 g. four-hourly until the urine became alkaline. For the intravenous injections the authors have employed a 5-per-cent solution of $NaHCO_3$, preferring this for two reasons to a solution of carbonate of soda; first, for convenience of dosage, the bicarbonate being, as distinguished from the water-holding carbonate of soda, a non-efflorescent salt; and secondly, to guard against local injury to tissues in case of any fluid escaping from the needle during the injection. They have not allowed themselves to be influenced by the circumstance that bicarbonate is during sterilization partially converted into carbonate, for the original 5 per cent or three-fifths normal bicarbonate solution remains, no matter how much is converted into carbonate, still alkaline. As to the solution, 500 Cc. would appear to have been appropriately chosen, for this has sufficed to restore, or just more than restore, to the blood its normal alkalinity. The lactate of soda—made by neutralizing lactic acid by soda—was chosen for the after-treatment both because it is very early tolerated by the normal stomach and because it is after absorption very rapidly (in the normal man in the course of a very few minutes) converted into carbonate. On account of the nausea and vomiting at the onset of gas-gangrene toxemia the oral administration of lactate of soda cannot at that stage replace intravenous injection.

Here two points may be adverted to. The first relates to the anesthetic for the operation; the second to the after-treatment of the amputation stump or incised tissues. In relation to the anesthetic it would appear to be the experience of all that chloroform must be avoided; that warmed ether gives much better results, and that nitrous oxide with oxygen is far the best anesthetic. It has been suggested in connection with these findings that the chloroform, and to a less degree the ether, narcosis may in the already acidemic patient aggravate the acidosis; but this would perhaps not be of so much moment in the case of the patient whose blood alkalinity had before operation been restored to the normal. With regard to the after-treatment of the wound it is of fundamental importance, where infected or "acidosed" (and because of that very easily infected) tissue has to be left behind, to evacuate all the corrupted lymph, replacing it by lymph normal in alkalinity; normal, if this should come into account, in sugar content; and normal (and that in this case means equipollent with the blood fluids) with respect to antitryptic power. To this end a local lymphagogue must be resorted to; and one of the writers has already more than once called attention to the very striking improvement obtained in these cases by the free application of 5-per-cent solution.

After comparing in the rabbit simple acidosis with gas-gangrene infection one would wish to be credited with the power of recognizing that the two conditions are not identical. Again, even if one were supposed to believe that we are in the toxemia of gas gangrene confronting a simple acidosis one would wish to be credited with the power of seeing that we cannot in a severe acidemic case, in which the whole salt content of the blood has been profoundly altered, hope by an injection of bicarbonate of soda to bring about a *restitutio ad integrum*. And even if one did think that a *restitutio ad integrum* could be effected, he would wish to get credit for seeing that he could not hope to get durable benefit from this where he has neither completely extirpated the infection nor yet successfully treated it by "drainage of the tissues." And, lastly, when one recommends the injection of alkali in gas-gangrene infection, one would wish it to be borne in mind that we have in such cases nearly always an associated streptococcus infection which would not be directly affected by injection of alkali.

In connection with gas-gangrene infection it may perhaps be permissible to point out that the benefit of alkali treatment is almost certainly not summed up by saying that by it the inoperable acidemic cases become operable. We may, in view of the data we have set out, quite reasonably hope that by the early administration of alkali the acidemia may be forestalled; and also that by it, so long as the circulation is still intact in the site of infection or its immediate neighborhood, an obstacle may be placed in the way of the growth of the infective agent.

REVISED IDEAS CONCERNING FOOT DEFECTS AND ORTHOPEDIC FOOTWEAR.

MARSHALL (*Boston Medical and Surgical Journal,* March 28, 1918) considers certain points regarding footwear of such importance that they should be emphasized again, although many of them are familiar: First, feet are plastic and can be molded. Second, foot deformities are produced mostly by continuous wear of one style of shoes. Third, results of causes operating previously for prolonged periods are shown by these most common foot deformities. Fourth, causes of abnormal weakness, pain, and disability are found most commonly in musculoligamentous weaknesses, strains, or irritations. Fifth, sharp distinctions in treatment of foot defects should be made between abnormal symptoms and foot deformities. Sixth, feet of persons in good health, who have never worn shoes, are flexible, and adapt themselves easily to innumerable unfavorable conditions. Seventh, feet of persons in good health are able to endure without injury, for variable periods of time, shoes that have pointed toes or broad ones, high heels or low ones, flexible shanks or stiff ones, shoes that are a trifle too short or long, or a trifle too wide or narrow for comfort across front parts at locations of transverse arches. Eighth, harm from high heels, pointed toes, and shoes fitted too short or too narrow comes only when they are worn too much of the time. Orthopedic shoes of most approved shape and fit are defective in one important respect, namely, that they tend to fix the feet in one position continuously, to the detriment of certain muscles and ligaments which become thereby weakened through comparative disuse. Ninth, several slightly different styles of shoes with variations in widths and flexibilities are preferable to a single shape and size of the most correct orthopedic last for individual wear. Thus is preserved more flexibility. One of the several styles should be the usual foot-shaped orthopedic shoe. Tenth, the causes of musculoligamentous defects include too much mechanical use of the feet; harmful variations in blood supplying muscles and ligaments; and defective nervous control of these tissues. Eleventh, vascular causes of musculoligamentous defects are obscure and numerous. Twelfth, clinically musculoligamentous weaknesses or irritations, *i.e.*, acute foot strains, are noticed in the following conditions: at times after prolonged illnesses like typhoid fever, scarlet fever, measles, pneumonia, and in connection with infections of tonsils, teeth, nasopharynx, and genito-urinary tract. Cachectic states associated with cancer, anemias, chronic pulmonary tuberculosis, are often accompanied by foot weaknesses and strains. Cardiorenal disease may lead to weakening and stretching of foot muscles and ligaments. Painful foot symptoms are commonly complained of before and after childbirth, due to important vascular and musculoligamentous changes going on at these times. Thirteenth, the most common vascular origin for mild transient foot symptoms probably is found in the numerous transient mild autointoxications and debilities arising from combinations of overwork, worry, high nervous tension, overeating, and other accompaniments of our modern complex life. Fourteenth, painful foot symptoms are indicators of underlying, often unrecognized troubles, which may be more serious than the resultant foot disability. Orthopedic corrections of foot deformities

can be as uncomfortable as repeated "breaking in" of shoes in the past which produced these structural defects. And it is unwise to omit the explanation to patients that corrective orthopedic appliances or shoes are not designed for increased comfort, but for slowly forcing feet back into normal shapes as rapidly as tolerance will permit.

Corrective apparatus should not be forced vigorously with feet that are showing symptoms of acute strain. Manipulations, exercises, and massage should not be omitted in more chronic types of foot troubles. Surgical treatment for deflected toes undoubtedly gives most satisfactory results in many long-standing cases of severe grade; but a very large number of hallux valgus patients can be equally improved by nonoperative methods. The simple expedient of wearing proper shoes with corrective pads and cuffs will relieve the majority of mild cases without surgically damaging the ligaments of transverse arches of feet, or without disabling the patients.

THE TREATMENT OF INCREASED INTRACRANIAL PRESSURE.

SHARPE (*Journal of the Medical Society of New Jersey*, March, 1918) observes that the most accurate and definite test of the increase of intracranial pressure is a lumbar puncture, using the spinal mercurial manometer. He gives credit to the Roentgen rays as of much assistance in diagnosing many spinal lesions. It is noted that almost 80 per cent of tumors of the brain are malignant, and even though surgically successful removal of the tumor is possible, yet the end results are the same. The pitiful condition of the patient is merely prolonged. Tumors of the spinal cord, on the contrary, are much more favorable. There is less liability of their being malignant; they can be more accurately located and are much more accessible surgically. Brain abscess usually results from otitis media, with its subsequent involvement of the mastoid; the usual site is the contiguous temporosphenoidal lobe, and less frequently the adjacent cerebellar lobe. As lesions of the cerebellum can be much more accurately diagnosed than those of the temporosphenoidal lobe, therefore, if we can rule out cerebellar abscess, the site must be the temporosphenoidal, especially the right lobe, in a comparatively silent area of the brain in right-handed patients.

Formerly the otologist in cases of suspected abscess of the temporosphenoidal lobe would puncture the dura in search of the abscess through the "dirty" infected field of the mastoid, as all operations for brain abscess are really exploratory procedures. It is distinctly unsurgical to open the clean subdural spaces and to puncture the cerebral cortex itself through an infected area; if the abscess is not located (and this frequently happens), then the patient runs the big risk of a resulting meningitis, and thus the usual occurrence—the exitus of the patient. Besides, the dura should not be punctured blindly with a knife or puncture needle, unless the dura has been opened so that it can be clearly ascertained whether an underlying cortical vessel is present or not; many disasters from the resulting hemorrhage have frequently occurred from such procedures. It is much more rational surgically and a much better exposure is obtained to locate the abscess if the operative incision is made through the "clean" subtemporal area, just as in a subtemporal decompression—the vertical incision naturally being used; if the abscess is found, then it can be satisfactorily drained through the lower angle of the incision at the base of the skull; and if the abscess is not found, then at least a decompression has been performed so that the intracranial pressure is relieved until the abscess may locate itself clinically, and the great danger of a meningitis and infective meningoencephalitis has been avoided.

Within the last five years the author has examined and treated almost fourteen hundred children having the condition of spastic paralysis. The condition may be due to hemorrhage, to lack of development, or to

a form of meningoencephalitis for which nothing really can be done. It is now possible to diagnose the ones due to hemorrhage from the other two conditions by means of careful ophthalmoscopic examinations of the fundi of the eyes and by a measurement of the pressure of the cerebrospinal fluid at lumbar puncture by means of a spinal mercurial manometer. If the ophthalmoscope reveals the signs of a definite increase of the intracranial pressure and those observations are confirmed by the spinal mercurial manometer, this pressure may be relieved permanently by subtemporal decompression, and definite improvement results both physically and mentally. In a series of 1400 cases there was increased intracranial pressure in about 20 per cent. These are the only ones who can be benefited by an intracranial procedure. In 298 operations the results are stated to be very encouraging. Naturally the younger the child the better the prognosis, the first few days of life being the ideal time for the operation, although most of the children have been between four and six years of age. It is stated that the type of internal hydrocephalus is comparatively infrequent and that the type of external hydrocephalus is the usual condition. Both result from earlier meningitis. The condition is therefore a diffuse one. It is said that the methods used recently in draining the ventricles in cases of internal hydrocephalus and of draining the subarachnoid and subdural spaces in external hydrocephalus by means of linen strands is a much more rational procedure surgically than any of the methods used in the past.

The mortality in the author's cases was 13 out of 41. For birth palsy, operation at the age of one month is advised, no anesthesia being necessary. If the palsy is only partial it is advised that the child should attain the age of three months before operation. There has been no mortality in a series of 104 cases. In spinal-cord injuries exploratory laminectomy is advised within a short time after the accident, unless it is clearly evident the cord has been entirely divided. As to fractures it is well known that if depressions are excluded the bone injury is the least important part to be considered in the treatment, whereas the presence of a marked increase of the intracranial pressure, with or without a fracture of the skull, should immediately cause the patient to be withdrawn from that large group of patients properly treated by the expectant palliative method, and the advisability of an early operative procedure to relieve the increased intracranial pressure should be considered.

The author states that he has treated in three years 239 adult patients having acute brain injuries. In only 34 per cent were there marked signs of an intracranial pressure. Therefore only these patients were operated upon to relieve this increased pressure, whereas the remaining 160 patients did not show definite signs of an increased intracranial pressure and were treated by the expectant palliative methods. It is stated that the mortality of fractures of the skull has been lowered from the average of 50 per cent of most hospitals to 30.7 per cent at the Polyclinic Hospital. And if the moribund patient dying within three hours from admission be excluded the mortality is lowered to 19 per cent.

In the treatment of brain injuries, with or without fractures of the skull, if the patient is allowed to develop definite paralysis, a lowered pulse-rate, Cheyne-Stokes respiration and pulse, and that appalling group of extreme intracranial pressure signs, then the author agrees entirely with the opinion so commonly now held that these patients "get along" just as well without operation as with operation at this last stage—the mortality being 50 per cent and over; but the patients with brain injuries should not be allowed to reach this dangerous stage of medullary compression due to the high intracranial pressure—it should be anticipated by accurate diagnostic methods now known, and if a marked increase of intracranial pressure is ascertained, then an early relief of it should be advised, not only to save the life of the patient but to lessen the post-traumatic conditions of changed

personality either of the excitable or the depressed type, persistent headaches, early fatigue, occasionally epilepsy, and that long train of post-traumatic conditions in brain injuries due, in the majority of cases, to a prolonged increase of this intracranial pressure.

SHOES, PHYSIOLOGICAL AND THERAPEUTIC.

ASHLEY (*New York Medical Journal*, March 9, 1918) notes that because of the generally good lines of the army shoe many men who have mild metatarsal weakness or deformity will be cured of their affliction. The unbalanced pronated foot in the recruit, when not discovered and corrected by a modified shoe, may become a rigid flat foot and the patient become a burden to the state for life. The physiological shoe should conform to the normal foot when in action. Those who desire to wear a physiological shoe are generally burdened with a heavy, toe-pinching, so-called orthopedic shoe which the "shoe doctor" clerk insists is the last word in physiological footwear. These shoes, with a few notable exceptions, purport to sustain the inner longitudinal arch, that being the one part of the foot which in the general mind can produce suffering which will cripple the foot function.

Ordinarily a flexible shank should be worn by one who has a foot with slightly impaired function. A foot with a deformity, as in a valgus tendency, necessitates a rigid shank and modified counter, heel, and sole, which would be designated as a therapeutic shoe.

Ashley has observed that hardly any one who has worn ordinary shoes approaches adolescence without deformity and some loss of function in the anterior foot. The effect of high heels and the consequent digitigrade progression occurs more frequently than the much-discussed longitudinal arch weakness, although this does not hold true in the clinic. In order of frequency the first sign will be metatarsalgia, or Morton's disease, Morton's toe, or Morton's neuralgia, metatarsal marbles, sensitive anterior metatarsal arch, callosities, and bruised, inflamed sesamoid bones of the great toe, inflicted upon the anterior foot by the body thrust making pressure upon these parts in the unnatural position assumed in high heels, combined with the effect of the thin "turned" sole and "rocker" sole. The comparatively low, drag heel, with weak shank gives the same mechanical strain, and is a very potent factor in producing these painful conditions.

A patient suffering with anterior metatarsal discomfort, complaining of numbness, burning sensations, cramps, etc., requires added toe room, a shoe built on physiological lines, permitting the great toe and all the toes to function. The heel should be somewhat lower than usual, with a strongly reënforced sole and metatarsal elevation one-eighth to three-eighths inch in thickness, placed well behind the heel. This metatarsal heel must be very carefully placed. If it is placed too far forward it will irritate; if too far back it will be inefficient. It should not be so wide as to impinge upon the extremity of the fifth metatarsal. Concerning the tender heel, felt cushions are advised hollowed out over the points of pressure. The anterior foot is often crushed, parboiled, characterless, with quite as much function and much resembling the nether extremity of the hermit crab. These conditions and the hallux rigidus are generally due to restricting pressure of short shoes and the wedging of the foot by slipping forward on the inclined plane made by the high heel and unstable heel seat. Mild deformity of the toes is to be met by plenty of toe room combined with a stable heel seat, and a snug waist, as outlined in the treatment of metatarsalgia. Due attention must be paid to cultivating the intrinsic muscles of the foot and the toe flexors by exercise.

Mild to severe bunions, hallux valgus deformities, and inflamed great toe joint may be treated successfully by making the shoes snug posterior to the ball to support the bunion, with a straight inner vamp line to the end of the great toe. Give plenty of

room over the distal extremity of the fifth metatarsal and little toe. Encourage the great toe to swing into a straight line with the center of the heel by cultivating the habit of walking with toes straight to the front. The shoes should "break" in line with the distal ends of the metatarsals. A further impulse to correction and relieving pressure of the great toe joints is given by elevating the sole one-eighth to one-fourth inch on the inner side, with a low heel, preventing weight and body thrust upon the anterior foot. To this end a snug waist and stable heel seat are highly desirable in this form of foot affliction. In the condition of hallux rigidus, the physiological shoe with a light steel spring in the sole prevents bending upward of the toe, the spring maintaining the straight sole. This will be efficient in relieving all but the most aggravated cases.

Occurring less frequently are the corns, bunions on the little toe and proximal and distal extremities of the fifth metatarsal, produced by the narrow toe and the shoe "run over" to the outer side, or excessively canted heel and sole.

SPIRAL FRACTURES OF THE TIBIA.

DAVISON (*American Journal of the Medical Sciences,* March, 1918) thus concludes a somewhat unconvincing paper on this subject:

Treatment of spiral fractures of the tibia by external reduction and external immobilization usually results in imperfect union of the fragments with defective function of the leg.

Treatment by open operation and autoplastic repair usually results in early good anatomical union of the fragments with restoration of the strength and function of the leg.

The autoplastic transplantation of bone in the repair of a recent spiral fracture of the tibia is a capital operation, which requires careful technique, capable assistants, and aseptic surroundings.

THE FOURTH VENEREAL DISEASE.

There is described in the *Indian Medical Gazette* for February, 1918, under this title a disease the outlines of which are given by Dr. OWEN as follows:

It usually begins on the sulcus coronarius, prepuce, or glans; commonly as one, sometimes as several small superficial erosions, which may heal in the course of a few days without treatment. At times the surface of these ulcers may show a bright-red color, while at other times they are covered with a grayish film of coagulated exudate and necrotic tissue. Where several small lesions are present, they usually coalesce in the course of a few days.

The most, in fact the only characteristic symptom of this type of venereal sore is the early and abundant production of a white or yellowish pus of a most foul odor. This pus, however, may be lacking in the early stages of the disease, or may have been kept in abeyance by mechanical cleansing.

The lymphatic glands are enlarged and usually painless, with the dorsal lymph cord sharing in the lymphatic involvement. Aside from the inguinal region there is no adenitis. Suppuration of the affected lymph glands does not occur.

The majority of patients show no constitutional symptoms, but in the gangrenous type where the destruction of tissue may be rapid and extensive profound sepsis may supervene.

Phimosis and swelling appear early and are often marked, making treatment difficult without surgical intervention.

This type of sore is most apt to be confused with chancroid, as both have the same incubation period, the sore usually appearing within two to seven days after exposure.

In chancroid, however, the ulcers are more likely to be multiple, and show contact infection on apposing surfaces which we have not observed in balanitis; and there is much greater tendency manifest to undermining of the edges of the ulcer with the production of a ragged and irregular border. Painful inguinal adenitis with resulting

bubo is common in chancroid, but has not been observed in balanitis of this type.

Balanitis cases show more abundant pus of a foul odor, and produce earlier and more marked edema and swelling. Phimosis is very common and appears quite early.

The process is differentiated from the Hunterian chancre by the much shorter period, by the rapidity of development of the pathologic process, and the production of the pus described above.

However, we have long ceased to depend on visual observation alone in differentiating between chancre and chancroid; for while there is a typical hard chancre, it is so often masked by an accompanying chancroidal infection that diagnosis is difficult if not impossible.

Indeed, Owen has found that at least 30 per cent of his cases of true syphilis are complicated by a chancroidal infection, and such cases can be diagnosed with certainty only by means of microscopic and serologic methods.

SYSTEMATIC CLOSURE OF THE SUPRAPUBIC WOUND IN PROSTATECTOMY.

PAUCHET (*La Presse Méd.*, 1917, p. 729) states that in Freyer's operation the wound requires from three to eight weeks to close, and even longer when the operation is done in two stages.

Pauchet says that complete cicatrization can be obtained in from twenty to twenty-two days by following a systematic closure of the wound.

After the prostatic intervention the bladder-wall is closed by two non-perforating U-sutures with No. 0 catgut, and these are knotted. The bladder mucous lining is not included in the suture.

Three sutures of silkworm-gut are taken in such a way that each forms a figure eight. These bring the rectus edges together, at the same time approximating the cutaneous edges. They are passed through the rectus muscle and twice through the outer bladder wall. The skin wound is closed by Michel clips. A compress is applied over the clips and the silkworm-gut passed and knotted over the compress.

After operation a drain is fixed and remains for nine days. On the tenth day it is replaced by a urethral tube for three days. The suprapubic wound can then be sutured. After suture a new retention catheter is fixed and remains eight days. On the twenty-first or twenty-second day this tube is withdrawn, as well as the suprapubic sutures. This method has always been successful. It was first used to combat urinary fistulæ in wounds which showed very retarded cicatrization. The constant success of secondary sutures had encouraged the author to systematically practice it early in all his operations of this kind.

There may be some urinary complications, but they usually clear up if the prostatic excision has been correct and complete.

Pauchet calls particular attention to the desirability of not leaving any particle of prostatic débris, otherwise the recovery may be protracted by complications.

He has operated in 477 prostatic cases. In his last series of 40 there has been no death, though the cases accepted are constantly becoming more of a risk as regards the heart and kidney conditions.

In the two-stage operation, the patient is restricted to a non-nitrogenous diet as far as possible, but otherwise lives his normal life. When the surgeon deems his physical condition in every way satisfactory and his resistance good, the time for the secondary prostatectomy is fixed.—*Surgery, Gynecology and Obstetrics,* May, 1918.

THE TREATMENT OF INGUINAL HERNIA.

GRIGSBY (*International Journal of Surgery,* February, 1918), after speaking of trusses, states that in no operation can a cure be so safely promised as in that for hernia. He quotes the statistics of the Hospital for Ruptured and Crippled. The percentage of deaths was 0.18. The factors contributing to the success of the operation are, first, selection of the proper procedure

suitable to the case; second, asepsis; third, nice, clean dissection with a minimum of trauma that will protect the vitality and nutrition of the tissues; fourth, complete hemostasis; fifth, removal of all foreign substance from the canal, such as fat, etc.; sixth, free exposure of the shelving portion of Poupart's ligament and the external oblique muscle; seventh, accurate approximation of the muscles and fascia used to repair the defects, and sutures loosely tied.

In direct hernia, or where there is atrophy of the internal oblique, portions of the rectus muscle or fascia should be transplanted and sutured to the shelving portion of Poupart's ligament. In all direct hernias the cord should be transplanted; otherwise closure of the defect cannot be accomplished.

GENERAL ANALGESIA BY ORAL ADMINISTRATION.

GWATHMEY and KARSNER (*British Medical Journal*, March 2, 1918) report a number of cases in which they have used what they call general analgesia. They base their preliminary report upon animal experiments and a limited clinical experience.

It will be seen that general analgesia in which there is loss of sensation, with or without loss of consciousness, can be established for otherwise painful dressings and for short operations. The desirability of such a procedure becomes apparent immediately on entering a military hospital, and it has also a definite place in civil surgery.

Many war wounds are accompanied by fractures of bones, and the importance of keeping such patients quiet is universally recognized. If the dressing of such a wound is accompanied by severe pain, it is customary at this base to produce nitrous-oxide-oxygen or light ether anesthesia for at least the first few dressings, necessitating in most cases, because of limitation of apparatus, removal of the patient to the operating-room. This usually means pain and the danger of misplacing the bone fragments before and after dressings, as well as loss of time to surgeons, nurses, and orderlies. General analgesia, produced simply and quietly without taking the patient from his bed, is the logical solution of this difficulty, and the technique evolved as the result of this study makes it possible to administer the analgesic by mouth in perfect safety. It is, of course, applicable practically to all forms of painful dressings, and is being developed to embrace short surgical operations, such as resection of a rib, removal of foreign bodies, revision of wounds. In such operations, however, it may be necessary to supplement the analgesia with novocaine for the skin incisions, a hypodermic injection of morphine, or even by light inhalation anesthesia.

After preliminary experiments on animals it was found that the best results were obtained by the use of ether in oil. This was open to the objection that it produced acute gastritis, but the olive oil was found to be a major factor in the causation of this result. A 65-per-cent solution of ether in oil has now been used in many thousands of cases of oil-ether colonic anesthesia without any sign of local irritation to rectum or colon, as has been proven by proctologic examination, as well as by the fact that no case of dysentery or bloody diarrhea has been observed.

The technique finally adopted was as follows:

One ounce of port wine is placed in a glass and the analgesic in another glass. The patient takes a mouthful of wine, holds it for about thirty seconds, rinsing the mouth so as to get the aroma in the upper air-passages and the taste well established, and then swallows the wine. The ether mixture is then taken and is followed immediately by the remainder of the wine. Several wines and liquors were tried, but port wine was found to be the most satisfactory. One of the authors and several other physicians have taken this "Lower sandwich," and have found it not disagreeable and to produce analgesia. As will be seen from the following notes, numerous patients have been given it with excellent results. Only one patient has been nauseated, a man who was violently opposed to taking the wine.

As opposed to that case it was given to another man, suffering from repeated attacks of vomiting, immediately after one of these attacks. His dressing was done without pain, and his vomiting ceased permanently. All the cases have been able to take food and water shortly afterward, and even in patients much exhausted by infection there have been no deleterious after-effects.

The formula now approved of is ether and liquid paraffin each a tablespoonful, peppermint water five minims.

The physiology of "general analgesia" by oral administration has not been subjected to an exhaustive investigation, but certain important facts should be borne in mind by those who contemplate using the method outlined. The oil and ether mix perfectly, and do not separate into layers. Baskerville has shown the rate of evaporation from minute to minute to be constant, so as to form a straight oblique line when plotted out. This holds true with different percentages of ether in the oil in all cases assuming a constant temperature and exposed surface. It is therefore impossible for the patient to get an overdose at one time and an insufficient amount at another time. The total amount is not absorbed at one time; if it were, the administration of 2 ounces of 50-per-cent ether in oil would produce complete anesthesia, as there would be liberated 1 ounce of ether. Only a light analgesia is obtained, which, for operative procedures, must usually be supplemented in some way. Naturally, the surface for evaporation is greater in the stomach than is the case in the colonic method, and the absorption of ether more rapid. The total amount that may be given with safety by this method has not yet been determined. It is considered advisable for the present to supplement the method either by local anesthesia or the administration of small amounts of anesthetic by inhalation. But it is important to remember that the patient is as safe by this method as if the ether were in a container outside the body. All anesthetics are analgesics, and before the danger zone is reached the patient must become anesthetized; hence the patient in the analgesic stage is separated from the danger zone by the period of anesthesia. The authors consider analgesia by this method as safer than any method of anesthesia. If the anesthetist carries his patient to the "blear-eyed," snoring stage, he defeats the object for which this special method was devised, the object being to take advantage of the analgesic stage of any and all anesthetics used. If adopted it would release from the routine of administration of anesthetics a certain number of physicians who now in military hospitals devote their entire time to that work.

It is felt that in so far as one can do so in a preliminary communication of this sort the following conclusions are justified:

General analgesia is safer than general anesthesia.

Fifty-per-cent ether in liquid paraffin or other bland oil is probably the safest general analgesic, it has apparently no deleterious effect upon the stomach, and is not followed by the nausea and vomiting that frequently accompany inhalation anesthesia. Its effect may be enhanced by the addition of a small amount of chloroform. It may be given without unpleasant taste when "sandwiched" between mouthfuls of port wine.

The method is especially indicated during the dressing of painful wounds without taking the patient from his bed or ward, and, when supplemented, can be employed for surgical operations.

INCARCERATED SEPSIS.

MORISON (*Lancet,* April 13, 1918) says that all surgeons meet with cases in which, as a result of slight trauma to a previously infected part, there has been lighted up an infection after the primary lesion had apparently soundly healed. For example, as a result of breaking down adhesions or of correcting deformity in a joint, the seat of former tuberculous disease, an acute tuberculous infection has followed and resulted in death from acute miliary tuberculosis or tuberculous meningitis in a short time.

It is common knowledge that even a slight trauma, such as removal of a drainage-tube or rough handling of a granulating surface in the process of dressing a wound, may be followed some hours later by an increased temperature. Cases also occur in which, as a result of a slight operation for tuberculous disease or for the removal of a septic focus, an acute general infection has been set up which has resulted either in the death of the patient or in serious illness.

These cases occur when the probability of a reinfection of the wound from without may be excluded. They happen in the practice of every surgeon, and the only explanation that can be offered is that during the healing process organisms have become incarcerated in the deeper scar tissue of the wound, and have been set free by the operation.

In the course of operations it may be evident that small foci of incarcerated pus or granulation tissue containing active organisms threaten the result, and in spite of attempts to sterilize the areas with a powerful antiseptic such as pure carbolic acid, infection of the wound may follow. It becomes necessary then to open up the wound and evacuate the pus. Between the examples of apparently normal scar and definitely infected areas there may be found a third variety, namely, small areas of softened tissues with much dense scar tissue around them, and bacteriological examination of these may demonstrate the presence of the usual pus-producing organisms found in septic wounds.

A further result of the continual irritation caused by the presence of these incarcerated organisms may be that a hard, dense scar is produced which causes pressure of underlying structures, especially serious when nerves are involved in it, or it interferes with the free movement of joints or of muscles. Where the scar is superficial great thickening of the skin and subcutaneous tissue results from keloid development similar to the familiar keloid burn scar. In the case of bone injuries a dense osteosclerosis is set up around such an infective focus, and when any strain is put on the part such as occurs in walking or running, a dull aching pain, with in some cases great tenderness of the bone, and constitutional disturbances may be produced.

For the past two years the writer has made it a part of the routine preparation of cases, previously wounded but now healed, before operation to order that the seat of injury be treated for a week or ten days with radiant-heat baths, from 150° to 250° F. for ten minutes daily. If incarcerated sepsis is present the scar in the course of two or three days becomes inflamed; finally, fluctuation occurs and, as a rule, a small quantity of pus is evacuated. The wound is then encouraged to heal, and after healing, in a period of time varying from two weeks to three months, according to the severity of the secondary manifestation of sepsis, a further course of radiant heat is ordered. If no reaction occurs within a week the operation may be safely proceeded with so far as any danger of buried sepsis is concerned. In no case of the author's in which this preliminary treatment has been carried out has there been failure with a rigid aseptic technique. The chief point he wishes to make is that the wounds have, after this course, pursued a healthy manner of healing and no further infection has taken place. A smaller advantage of radiant-heat treatment is that the scars become more healthy and thinner, more mobile, and more elastic.

THE TREATMENT OF ENUCLEATION OF TONSILS.

HILL (*Practitioner,* April, 1918) as the result of a comprehensive study of the subject states that serious hemorrhage is rare in connection with tonsil operations, but when it does occur may be a very grave complication.

Prophylactic treatment is useful in "bleeders" and in anemic subjects.

Hemostatic methods of enucleation demand both experience and skill on the part of the operator and anesthetist, and a fairly prolonged and deep anesthesia is usually necessary. Open ether, preceded by a hypo-

dermic injection of atropine, is the safest combination for deep anesthesia.

Hemostatic methods that insure dry tonsillar beds at the termination of the operation provide the most reliable prophylaxis as regards hemorrhage, whether early or remote.

Skilfully applied pressure can be relied upon to arrest most forms of tonsillar hemorrhage, whether primary or secondary.

Failing relief by pressure, single or multiple ligaturing of bleeding points is nearly always effectual.

Suturing the pillars, either by means of Michel's hooks or by Irwin Moore's highly ingenious and practicable technique, is a sure temporary measure in those rare intractable cases in which separate ligaturing, skilfully carried out, fails.

Styptic topical applications and hypodermic medication are usually unreliable expedients.

REVIEWS.

A Diabetic Manual. For the Mutual Use of Doctor and Patient. By Elliott P. Joslin, M.D. Illustrated. Lea & Febiger, Philadelphia, 1918.

This book is one of the most remarkable that we have been called upon to review in an experience of many years, because it is written by one who has been very active and efficient in studying the scientific aspects of the condition known as diabetes mellitus, and his scientific training would be expected to lead him to the belief that a book for the laity would be inadvisable, particularly when it deals with a problem which is so complex as this one.

As we have stated on a number of occasions in regard to other works, a medical man cannot set himself a more difficult task than the preparation of text dealing with medical matters for those who have not been trained in a medical school. Almost without exception authors who have made this attempt have prepared their text in such an elementary form that it was hopelessly inadequate, or have, by inadvertence or intent, gone so deeply into the scientific aspect of their subject that the lay reader flounders about in an endeavor to understand the meaning of scientific sentences and very frequently gets an utterly erroneous conception of their meaning.

Dr. Joslin has been one of those who, for a long time, has advocated that diabetic patients should be taught to examine their own urine in order that they might, to a certain extent, control their dietetic treatment. It goes without saying that there are certain advantages and disadvantages associated with this plan. The advantages are that frequent examinations are made and the patient is able, without direct medical advice, to creep up on his diet or to cut it down. The disadvantages are that a very large number of diabetics are exceedingly nervous and apprehensive, suffer from grave mental depression, and therefore may become introspective and unduly alarmed about themselves when an examination of their own urine seems to them to give discouraging results. Again, as we all know, it is not the amount of sugar in the urine which is the danger-signal, but the quantity of ketone bodies which are present, and the estimation of these ketone bodies, even if it be qualitative and not quantitative, is quite beyond the skill of the uneducated individual. Then, too, it has always seemed to us that in diabetes, above all other diseases, it is necessary that the patient shall be kept under continuous observation, and if he is taught to examine his own urine, he is prone to call upon his physician but rarely for advice, and so, using his urine as a guide to his condition, may fail to notice certain symptoms which are distinct danger-signals, clearly seen by the trained mind of the physician.

It is interesting to note that the book is dedicated to the "Diabetic Patients of the

United States, upon each one of whom rests responsibility of saving food in war-time." We confess that we had not thought of the diabetic as the individual from whom this patriotic act could be expected.

The book contains 170 pages of text. After chapters dealing with the general consideration of diabetes, it takes up the treatment of mild cases, the improvement which has taken place in the treatment, questions and answers for diabetic patients, and then follows a chapter called "Diabetic Arithmetic," which begins in the form of a letter addressed to a grammar-school girl named Freda. This remarkable letter begins as follows: "Dear Freda—Diabetic patients often get discouraged about the arithmetic of their diet, and it has occurred to me that if I can explain it to you, a little girl, the same explanation would be simple enough for grown-ups." We do not know whether "Dear Freda" actually exists, or whether she is an invention, but our readers will agree with us that this is a most unusual way to advise medical men, or patients, as to the means of calculating food values. As a matter of fact, the information which is given in this chapter is excellent and practically duplicates that which is given in Dr. Joslin's large book on Diabetes, which, by the bye, is mentioned in the Preface, and which, without doubt, will almost certainly be bought by the diabetic patient, who is sure to devour it and to develop mental indigestion with many questions and symptoms which will surely put his family physician in a dilemma.

The next chapter is entitled "Efficiency in Visits to a Doctor," in which directions are given to the patient as to what the patient should be prepared to tell the doctor when he sees him. Then comes one upon "Hygiene for the Diabetic."

The second part of the book deals with the details of dietetic treatment, discussing the diet of normal individuals and diabetics and the treatment dietetically of moderately severe and severe cases.

In the chapter dealing with acid intoxication the patient is informed that even when patients already showing acidosis come for treatment it usually disappears under the above plan, and that this plan of treatment seldom fails.

The author is distinctly opposed to the employment of alkalies, intravenously and subcutaneously, in acidosis. He naturally advocates increasing the diet in carbohydrates and advises the use of digitalis to support the heart, and the administration of caffeine subcutaneously, or as black coffee by the rectum.

There is a chapter on the care of the teeth and the skin of the diabetic. Page 110 contains less than fourteen lines dealing with the drug treatment of this disease. In his concluding sentence of this chapter, which is to the effect that drug treatment is useless, Joslin says: "I wish I knew of a good drug for diabetic patients. It would save me so much time and talk."

Part three deals with diabetic menus and recipes and contains also exhaustive diet tables.

When we come to part four the general practitioner will be somewhat aghast at the information which is prepared for a layman, for in this chapter not only are directions given as to the reaction, specific gravity, albumin, and sugar content of urine, with methods of estimation of qualitative as well as quantitative analysis, but, in addition, methods are given for determining the presence of diacetic acid and acetone, quantitatively estimating ammonia by the Ronchese-Malfatti method, and also nitrogen estimations; and, again, directions are given as to the estimation of blood sugar and the examination of the expired air for carbon dioxide. If a patient with diabetes learns to do these things he will be prepared to act as a laboratory assistant to the physician, and if he is so well-balanced as not to be overcome by his results, he will belong to that class in which it is true that "a little learning is a dangerous thing."

The profession owes so much to Dr. Joslin for the splendid work that he has done

that we cannot help feeling regret that a book intended for the laity should go far beyond what seem to us legitimate lines.

These criticisms, which are based entirely upon the preparation of a book for the laity, of course, have no value when applied to its use by medical men. As a matter of fact, every medical man, who is not a specialist in the treatment of diabetes, will find in the pages of this book exactly what he wants; in other words, the information by which he can skilfully and scientifically treat a diabetic and carry out all the tests which are actually necessary in such treatment. We prophesy great popularity for this volume amongst medical men for their own use, and a corresponding lack of popularity in its recommendation by medical men to diabetic patients.

LESSONS FROM THE ENEMY. How Germany Cares for her War Disabled. By John R. McDill, M.D., F.A.C.S. Illustrated. Medical War Manual No. 5. Authorized by the Secretary of War and issued under the Supervision of the Surgeon-General and the Council of National Defense. Lea & Febiger, Philadelphia, 1918. Price $1.50.

The author of this book, having had opportunities for medical service in this war in England, France, Germany, and Austria, finally selected Germany as the most interesting field, because in Germany we have had no military medical observer and, up to the present time, the least has been written concerning German methods. The organization of an American Physicians' Expeditions Committee in New York to send independent hospital units to the Central Powers before America entered the war afforded opportunity for Dr. McDill to obtain the information about which he now writes. During 1916 he was at two large German posts. The contents of the book deal with German medico-military organization, sanitary service in the German army, description of military base hospitals, war nursing, reëducation of the disabled, orthopedics, artificial limbs, a word to our sick and wounded soldiers, and a consideration of social health insurance and hospital systems in times of peace.

APPLIED BACTERIOLOGY. Edited by C. H. Browning, M.D., D.P.H. Oxford University Press, New York and London, 1918. Price $2.50.

The first four chapters deal with the scope of applied bacteriology, the diagnosis of "enterica" infections, the use of calibrated pipettes in serological work, and observations on the diphtheria group with special reference to the recognition of pathogenic members. This is followed by studies on antiseptics with special reference to the relationship between bactericidal action and chemical constitution, the influence of serum on antiseptic action, etc. Then follow chapters dealing with the isolation of the typhoid-paratyphoid group and on the possibility of employing ultra-violet radiation as a means of discrimination between organisms. The last chapters deal with the chemistry of antibody reactions, the immunity reactions of the coli group, and tetanus.

LABORATORY METHODS OF THE UNITED STATES ARMY. Illustrated. Lea & Febiger, Philadelphia, 1918. Price $1.50.

This is No. 6 of the Medical War Manuals authorized by the Secretary of War and issued under the supervision of the Surgeon-General and the Council of National Defense. The text has been compiled by the Division of Infectious Diseases and Laboratories, and its design is clearly indicated in its title. Like other numbers of this series, it is bound in flexible binding, and, as it is less than half an inch thick, six inches long, and four inches wide, it can readily be carried in the pocket of a blouse. By the use of thin paper 256 pages, closely printed and yet in easily read type, are between its covers. The statement is made that it is not intended as a text-book but as a working manual giving the formulæ and technical methods which will be useful in carrying out laboratory examinations which officers of the medical corps will be called upon to perform in stationary and field laboratories. It is also published with the desire to establish as far as possible uniformity of procedure in the Army laboratories, and the technical procedures given are those which, in the opinion of the

Surgeon-General, are the best available at the present time. The first part is devoted to a consideration of the responsibilities of the laboratory, general rules for the conduct of the laboratory, and then follow methods of examining sputum and other secretions, or excretions, as well as sanitary examination of water and sewage and bacteriological examination.

The book is a most excellent one. Not only will it prove of great value to the Army medical officers, but there is scarcely a practitioner of medicine who is interested in the laboratory investigation of his cases who can afford to do without it.

MEDICAL WAR MANUAL No. 4. Authorized by the Secretary of War and under the Supervision of the Surgeon-General and the Council of National Defense. Military Orthopædic Surgery. Prepared by the Orthopædic Council. Illustrated. Lea & Febiger, Philadelphia and New York, 1918.

This handbook, containing some 240-odd pages, of such size as readily to be carried in the pocket, and based in considerable portion on Jones's teaching, is a truly admirable manual for both the military surgeon and the general practitioner, covering as it does the Human Foot; The Soldier's Foot and the Military Shoe; Injuries to Joints and Their Treatment; Disabilities of the Knee-joint; Positions of Election for Ankylosis Following Injuries of Joints; The Spine: Its Physiology, Examination, and the Significance of Its Abnormalities; Methods of Treatment for Disabilities Following Nerve Injuries; United and Malunited Fractures; Bone Grafting; Methods of Fixation, Plaster-of-Paris Dressings, Splints, and Other Apparatus.

It is written with singular clarity, profusely and adequately illustrated, describes the making and application of the standard military splints, gives formulæ for the various adhesive glues; has a supplementary chapter upon Methods of Fixation, Additional Apparatus and Methods adapted from a manual prepared by a Board of Medical Officers in France; describes the making of a Balkan Frame, and covers the ground almost to the instant. Indeed, it would be hard to imagine a more condensed, a more reliable, and a more modern summation of the knowledge recently acquired concerning the topics discussed.

1915 COLLECTED PAPERS OF THE MAYO CLINIC, ROCHESTER, MINN. Illustrated. W. B. Saunders Company, Philadelphia and London, 1916. Cloth, $6 net; Half-morocco, $7.50 net.

There are probably no publications more welcome to the practical surgeon than the collected papers of the Mayo Clinic. Among the list of contributors to Volume VII are found Balfour, Braasch, Graham, Judd, MacCarty, Mann, Charles and William Mayo, Pemberton, Plummer, Rosenow, and Louis Wilson.

In the space devoted to the Alimentary Tract is considered The Bacteriology of Ulcer of the Stomach and Duodenum in Man, by Rosenow and Sanford; The Trophic Element in the Origin of Gastric Ulcer, by Durante; further experimental work on the Development of Gastric Ulcer Following the Removal of the Adrenals, by Mann; a most careful study of the Roentgenologic Determination of Gastric Motility and Roentgen Diagnosis of Cancer, by Carman; A Study of the Essential Factors in the Diagnosis of Chronic Gastric and Duodenal Ulcer, based on 2400 cases of gastric and duodenal ulcers operatively demonstrated in the Mayo Clinic from 1900 to 1914; Notes on Gastric and Duodenal Ulcers, by Graham; Differential Diagnosis of Lesions of the Stomach and Duodenum, by Beckman; a paper on Operative Technic and Gastric Ulcer, by W. J. Mayo, and one by the same author on Chronic Duodenal Ulcer; Cholecystostomy Versus Cholecystectomy is discussed by Charles Mayo with his customary brevity and lucidity. W. J. Mayo contributes a paper on Restoration of the Bile Passage After Serious Injury to the Common Hepatic Duct. Rosenow presents his extraordinary paper on Pathogenesis of Spontaneous and Experimental Appendicitis, Ulcer of the Stomach, and Cholecystitis. Braasch publishes his important contributions to the Surgery of the Urogenital Organs. There is found Ken-

dall's communication on The Isolation in Crystalline Form of the Compound Containing Iodin which Occurs in the Thyroid. Wilson contributes a paper on Pathological Changes in the Muscular and Nervous System in Goitre. Plummer writes on Blood Pressure; W. J. Mayo on the Relation of the Spleen to Certain Anemias and Surgical Considerations of Splenectomy. Charles Mayo has a brief but admirable paper on Hydrocephalus, Spina Bifida, and Allied Diseases. Beckman shows excellent results in the formation of noses from the transplantation of cartilage. Mann writes on Shock and Hemorrhage. Then follows Rosenow's investigation on Elective Localization of Streptococci; The Etiology and Experimental Production of Herpes Zoster by Rosenow and Sverre Oftedal; and Charles Mayo's papers on Errors in Anatomic Development and Infection a Cause of Local and General Disease. MacCarty's Studies on the Etiology of Cancer are especially noteworthy.

THE SURGICAL CLINICS OF CHICAGO. Volume I, Nos. 1, 2, and 3. W. B. Saunders Company, Philadelphia and London, 1917.

This book, Volume I, No. 1, designed to take the place of Murphy's Clinics, has as its contributors Andrews, Beck, Bevan, Eisendrath, Kanavel, Lewis, McArthur, Ochsner, Phemister, Plummer, Ryerson, and Speed. The subjects discussed are Gallstone Diseases, Hernia, Plastic Surgery, Fracture of the Patella, Congenital Pyloric Stenosis, Neurolysis; and the Treatment of Large Cavities for Empyema of the Chest. A well-illustrated, clearly expressed study of certain phases of modern surgery.

Volume II takes up Cancer of the Breast, by Ochsner; Pernicious Anemia, by Percy, as treated by splenectomy and blood transfusion; Congenital Dislocation of the Hip, by Ridlon; Surgical Lesions of the Colon, by Bevan, with suggestions by Andrews to use divided blood-vessels as an aid to accurate wound closure; Plastic Operation of the Upper Extremity, by Carl Beck; the Technique of Removal Through the Mouth of a Bullet Lodged Between the Atlas and the Base of the Skull, by Kanavel; Suppurative Pericarditis, by Davis; with Case Reports of Bone Transplantation and Arthroplasty, by McKenna.

The third number of Volume I contains a number of interesting cases, among others some of McArthur's, showing extraordinary results in the treatment of Thrombo-Angiitis Obliterans by diluting the blood so that its viscosity is reduced. The treatment consists in the hypodermic injection of normal salt solution a liter at a time and repeating it frequently. McArthur modified this by using the solution intravenously. After repeating the injection one of two things occurs, either the vein becomes obliterated or the tissues become so sore locally that the patients are disinclined to continue treatment. Therefore the fluid is introduced into the duodenum through a Rehfuss tube. Instead of giving 1000 Cc. two or three times a week a gallon or a gallon and a half is given a day, thus markedly reducing the viscosity of the blood. Moreover McArthur used Locke's solution.

Beck makes interesting comments upon the treatment of Obstinate Sciatica, this consisting in putting the patient's leg in a plaster cast in a perfectly extended position, and while the trunk is held flat on the table, back down, the leg is raised from the table, flexed at the hip, and suspended on a roller, just as in the treatment of fractures of the femur in children, or fastened with a plaster ring around the abdomen. This resulted in a complete cure. Eisendrath presents an interesting communication upon Gunshot Wounds of the Skull. David advises local anesthesia for hemorrhoidectomy and describes an efficient method. Percy contributes a paper upon Resection of the Stomach for Carcinoma. Culbertson writes upon Therapeutic Abortion and Sterilization. Parker, dealing with the Treatment of Burns, observes that it is a surgical crime to apply antiseptics to burned surfaces, that there is no fluid so well adapted to them as the patient's own serum. He prefers adhesive plaster as a dressing to granulating

surfaces applied twice a week, or sometimes daily; over this a gauze dressing. He observes that the best thing that can be said of the open-air treatment of burns is that it is better than some very poor treatments.

These Clinics carry with them the spirit of research, originality, and a striving for betterment in surgical practice.

COLLECTED PAPERS OF THE MAYO CLINIC. Volume VIII, 1916. W. B. Saunders Company, Philadelphia and London, 1917.

Volume VIII, as is true of its predecessors, represents in every department the very forefront of sound surgical progress. Balfour writes on Cancer of the Uterus; Splenectomy and its Indications; the Technic and the Surgical Treatment of Gastric Ulcer. Beckman takes up the subject of Trifacial Neuralgia from its Diagnostic and Therapeutic Standpoint. Braasch contributes to the subject of Surgery of the Kidney, dealing particularly with Nephrolithiasis and Polycystic Kidney. MacCarty and Broders write on Diagnosis of Mammary Conditions and particularly on the Clinicopathologic Nomenclature of these Lesions. Judd deals with Cholecystitis, the changes produced by Removal of the Gall-bladder, the principles involved in patients suffering from Enlargement of the Prostate, Surgery of the Thyroid, and Transplantation of the Ureter following Traumatism and Resection of the Bladder for Cancer. Kendall continues his studies on the Thyroid and considers the factors other than the Kidney in influencing the Retention of Phenolsulphonephthalein. MacCarty gives the reason for legitimate diagnostic error in X-Ray Diagnosis of Gastric Carcinoma and Ulcer. Charles Mayo writes on the Choice of Operative Procedure in Cancer of the Rectum and Pelvic Colon; Gall-bladder Diseases; Nature, Value, and Necessity of Team-work in a Hospital; The Omentum, Its Physiologic Value and the Need of its Preservation; Removal of the Right Colon: Indications and Technic. William J. Mayo writes on the Indications for Splenectomy; The Radical Operation for Cancer of the Rectum and Rectosigmoid; The Radical Operation for Cure of Cancer of the Second Half of the Large Intestine, not Including the Rectum; and The Removal of Stones from the Kidney. Rosenow continues his Studies on the Causation of Gastric and Duodenal Ulcer by Streptococci; The Etiology of Cholecystitis and Gall-stones and Their Production by the Intravenous Injection of Bacteria; and on Epidemic Anterior Poliomyelitis. Stokes contributes a paper upon the Hospital Problems of Gonorrhea and Syphilis.

This volume, an essential part of the surgeon's working library, is far more than a help to him in his daily work. It is a stimulus to more work, to better work, and to the search into the cause of things upon which all progress is based. Moreover, it is a striking example of scientific studies which keep clearly in view the ultimate object of carrying help and cure to those who are suffering or crippled.

SYPHILIS AND PUBLIC HEALTH. By Edward B. Vedder, A.M., M.D. Published by Permission of the Surgeon-General, United States Army. Lea & Febiger, Philadelphia and New York, 1918.

In Vedder's introduction he gives convincing evidence to the effect that syphilis as the cause of morbidity and mortality belongs at the top of the list among the infections. As to the prevalence of the disease, traversing the statistics of the world seems to show that between 50 and 100 per cent of prostitutes are infected, and from 15 to 30 per cent of the insane; from 20 to 30 per cent of all admissions to the hospitals; 20 per cent of tuberculous patients; 20 to 40 per cent of criminals; about 20 per cent of presumably healthy young men, the class that enlist for the army; from 3 to 20 per cent of presumably healthy women; and in the negro about twice the percentage of the whites.

As to the congenital source of infection, Warthin is quoted to the effect that in 31 out of 36 male syphilitics the lesions were found in the testes at autopsy. In both congenital and acquired syphilis the testes

swim with spirochetes even when no histological changes can be recognized in the organ. It is believed that in such cases great numbers of spirochetes must gain entrance to the tubules and pass out with the semen. Vedder states that transmission to the fetus direct is impossible.

Since most prostitutes are syphilitic it is evident that any sanitary measures taken for the prevention of disease without treating the problem of prostitution are doomed to failure.

As to personal prophylaxis the methods are considered which may be undertaken by the individual to prevent genital infection. Most authorities agree that the use of the condom is an almost certain guard against syphilitic infection, being even more reliable than prophylactic ointments. It is noted that Warren, an English physician, in 1771 advised every man of pleasure to carry with him a box of mercurial ointment, a bottle of weak solution of caustic potash, and a syringe. Calomel ointment, the one of choice, to be effective should contain 33 per cent of calomel, incorporated in lanolin as a base, and great care should be exercised in its preparation to insure thorough mixing. Syphilis can undoubtedly be prevented by the use of various prophylactics, and particularly by 33-per-cent calomel ointment. It cannot be expected to be invariably successful, but if properly applied during the first hour after exposure will prevent the great majority of infections.

An excellent section on Syphilis and Marriage is incorporated.

As to cure, Vedder states that the army experience with this disease is very large and is more satisfactory than most private practice because the men are continuously under observation for several years. In 1911 the following standard was tentatively adopted: One year without treatment, without any suspicious clinical symptoms with a number of negative Wassermann reactions and no positive ones. The standard was changed to one year without treatment, without any suspicious clinical signs, with several negative Wassermann reactions and no positive ones, and with a negative provocative Wassermann reaction and luetin test at the end of the year. Of 5000 cases about 120 have fulfilled this standard. In no instance has there been evidence that the man was not cured. In some instances the contrary has been shown by the fact that the man reacquired the disease.

The treatment of prostitution is a sociological problem. The author is not inclined to attach much value to sex education. As to the control of venereal disease methods which have been tried and failed are discussed at length, as is the method adopted by the United States Army for the purpose of accomplishing this purpose.

An excellent book, with an unusual wealth of references, accurately tabulated, carrying conviction from calm, skilful and dispassionate presentation of facts.

THE CLINICS OF JOHN B. MURPHY, M.D. Volume V, No. 3; Volume V, No. 5; Volume V, No. 6. Edited by P. G. Skillern, Jr., M.D. W. B. Saunders Company, Philadelphia and London, 1916.

Practically all of Murphy's great contributions to surgery have the rare quality of permanence, nor did he touch upon any subject without bringing to it clarity of vision, a concept of the desired end, and the means of most rapidly and surely attaining it. Thus his Clinics have more than passing value. Nor are these volumes exceptions to the rule. His talk on Varicose Veins and Varicose Leg Ulcers is as modern as though it had been written to-day. Among the subjects discussed and cases described in Volume V, No. 5, are cicatricial fixation of the mandible following noma, with the release and interposition of mucosa flaps; carcinoma of the cecum; suprapubic cystotomy and plastic for cicatricial obstruction of the bladder outlet; conservative treatment of coxa vara; carcinoma of the mucous membrane of the cheek; and a series of sketches showing a method of treating ankylosis of the fingers by grafts of costal cartilage.

The value of these case records lies in Murphy's comments upon them and the prompt efficiency with which complications

and difficulties were encountered and surmounted.

In Volume V, No. 3, the Conservative Treatment of Diverticulum of the Esophagus is reported on, with a general discussion of the operation and its indications; also Post-operative Ventral Hernia. Murphy gives a talk on intestinal obstruction and on post-ventral hernia and fecal fistula. He treats polyposis of the sigmoid by enterotomy and ablation. He discusses perirectal sinus, and reports on a case of neoplasms of the kidneys. The book is marked throughout by his inspiring comments.

THE PRACTICE OF GYNECOLOGY. Sixth Edition, Revised. By W. Easterly Ashton, M.D., LL.D. W. B. Saunders Company, Philadelphia and London, 1916. Cloth, $6.50 net; Half-morocco, $8.00 net.

This revision of Ashton's Gynecology, well known and largely useful, has had a number of alterations bringing it in line with current practice. The general text of the volume remains the same, but nothing is taken for granted. In describing gynecologic diseases the directions and illustrations are so explicit that they may be intelligently and easily followed. In each instance the author has given the technique which in his judgment is the best, describing variations which may be required in the management of atypical cases. The illustrations, all new, and numbering more than 1000, have been made under his personal supervision from actual apparatus, living models, dissections on the cadaver, and the operative techniques of other authors. All the instruments, needles, and suture materials used in important operations are shown by a separate drawing. The same plan has been followed in illustrating the instruments used in making the various gynecological examinations. The drawings which illustrate the pathological conditions met in gynecological practice are purely diagrammatic in character and made to represent typical lesions.

The arrangement of the book on an anatomic basis permits a discussion of the methods of examining each organ before describing its disease and renders unnecessary the usual chapter on Physical Examinations, which, on account of its broad generalization, tends to confuse the student.

The first few chapters are devoted to General Technic of Gynecologic Examinations; Microscopic and Bacteriologic Examinations; The Blood in Relation to Surgery; Examination of the Abdomen; Examination of the Rectum; The X-Rays in Gynecology; Hydrotherapy; Constipation; Diet; Indoor Exercises; Saline Injections; The Causes of Diseases Peculiar to Women; and History Taking. Thereafter follows an anatomical classification of subjects beginning with the Vulva and terminating with Tumors of the Round Ligaments. Among other topics discussed are Hysterectomy for Diseased Appendages; The Urethra; The Bladder; Movable Kidney; Sterility; Coccygodynia; Antisepsis in Hospitals and Private Houses; Technic of Special Operations; Appendicitis; Tuberculosis of the Genital Organs.

Dealing with sexual relations and marriage the author states that long engagements are the cause of the breakdown which happens to so many young women when for financial or other reasons their marriage is indefinitely postponed.

To the occasional gynecologist this book is of prime value, as it gives him in detail his methods of examination, his diagnostic data, and his operative technique. To one skilled in the art it will be found largely helpful.

THE TREATMENT OF WAR WOUNDS. By W. W. Keen, M.D., LL.D. Illustrated. W. B. Saunders Company, Philadelphia and London.

This brief summary of current practices includes observations on Dichloramine-T with the older technique of dissolving in eucalyptol, a method which has been found to produce a compound which makes it unfit for use. The writer has carefully avoided authoritative pronouncements on any subject. To his book are appended some interesting letters.